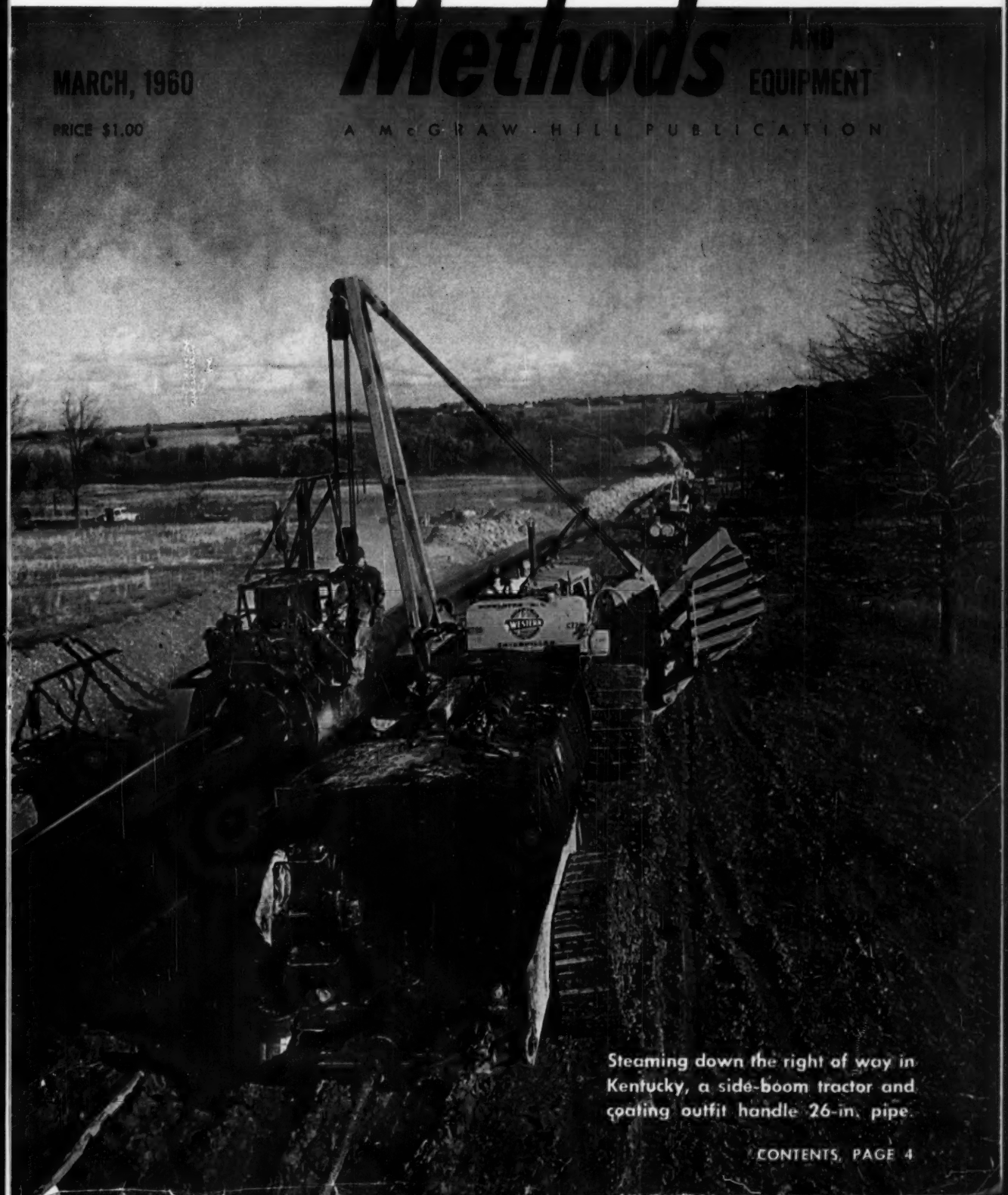
Construction Methods AND EQUIPMENT

MARCH, 1960

PRICE $1.00

A McGRAW-HILL PUBLICATION



Steaming down the right of way in Kentucky, a side-boom tractor and coating outfit handle 26-in. pipe.

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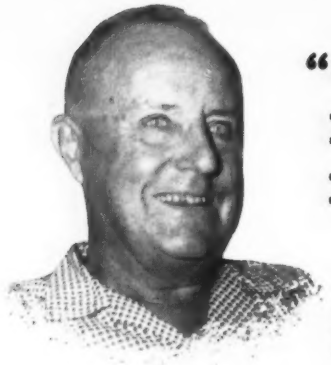

"Our improved control with POZZOLITH cuts costs on the Eglin Air Force Base job"

W. J. NOONAN, SR.,
President, Noonan Construction Co.,
Pensacola, Florida

DRY-BATCH PLANT located on the Gulf—approximately 9 miles from the job site. Most aggregates were delivered by barge from Radcliffe Gravel Co., Inc. of Mobile Alabama. Ideal Cement was also transported to the batch plant by this method.

THIS CONTRACT at Eglin Air Force Base involved the placing of 110,000 cubic yards of unreinforced concrete. Pavement ranged from 14" to 22" thickness. Supervising the job is W. J. Noonan, Jr., General Manager, Noonan Construction Co. • Curtis Sullens, Concrete Supervisor, Corps of Engineers, Mobile District • John Day, Project Superintendent, Noonan Construction Co.

"Corps of Engineer specifications called for 650 psi flexural strength with 4½% ±1½% entrained air. We knew that with local materials and good control, a plain mix with a cement factor of about *6* sacks per cubic yard should produce this strength.

"We also knew that with POZZOLITH we could meet this flexural specification with 5 to 5.2 sacks and that POZZOLITH would provide close control of entrained air, as well as lower finishing costs. So we based our bid on using POZZOLITH.

"The job was started with a POZZOLITH mix having a cement factor of 5.8 sacks. Because of uniform strength results, well above specification, it was gradually reduced to the 5.2 sack factor which we used in our original estimates. The uniformity in batches, absence of bleeding, and exceptionally good workability kept finishing costs down. Air content was easily maintained at 3½% with minor adjustments being made quickly in the field.

"The Master Builders field man worked with us from start to finish giving us the benefit of his experience. This resulted in better quality concrete at lower cost to the owner and substantial savings to us."

For lowest cost-in-place . . . superior quality concrete—there's no equal to today's POZZOLITH. Call in the local Master Builders man to demonstrate how POZZOLITH can help put you ahead on your very next job.

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**POZZOLITH is a registered trademark of The Master Builders Co. for its concrete admixture to reduce water and control entrainment of air and rate of hardening.*

B.F.Goodrich

General Contractor: Merritt-Chapman & Scott Corp.

Rubber sends mountains of rocks to help bottle up a river

B.F.Goodrich improvements in rubber brought extra savings

MOUNTAINS of rocks, gravel and sand carried on those conveyor belts are made into concrete for a tremendous dam across the Colorado River. Engineers figure it will take *10 million* tons of this stuff to build a towering 700 foot wall stretching 1500 feet across the canyon. But contractors can't afford to have any delays caused by belts breaking down—thousands of men would be made idle.

B.F.Goodrich men, working with the contractors, suggested they use conveyor belts made with Nyfil fabric. These belts use nylon for cross threads in the fabric. They were developed by B.F.Goodrich to make the belts so strong they can stand the wear and tear that caused other belts to break down. And, most important, they cost no more than other belts.

These B.F.Goodrich Nyfil belts have been working on the Glen Canyon Dam project for two years now—16 hours a day, 5 days a week. There hasn't been a single breakdown and these belts are expected to give the same kind of service during the entire 5 or 6 years it will take to build the dam.

Part of the B.F.Goodrich service on big construction jobs like this is a special maintenance crew on the site. They give on-the-spot service to the belts, hose and tires so contractors lose as little time as possible keeping equipment on the job.

For complete information on the conveyor belt described here and all the other rubber products B.F.Goodrich makes for industry, call your B.F. Goodrich distributor. *B.F.Goodrich Industrial Products Company, Department M-788, Akron 18, Ohio.*

B.F.Goodrich *industrial rubber products*

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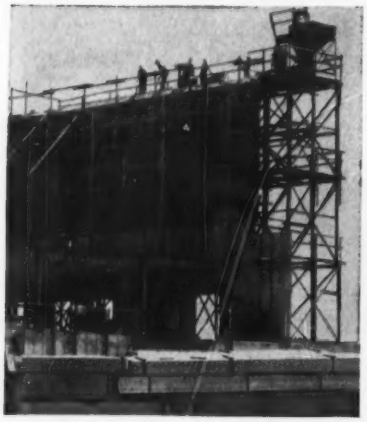
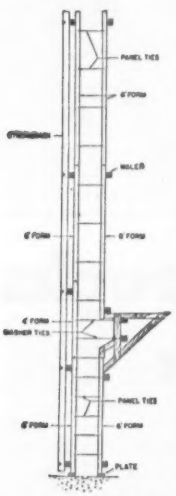


Extensive Use of Symons Steel-Ply

...Speeds Work on "Rush" Job

New, non-military, air route traffic control center building near Fremont, California will help control and direct aircraft, prevent collisions, and guide "lost" planes over a wide western area. J. H. Pomeroy & Co., Inc. San Francisco was the contractor.



The project was unusual because of the speed with which it had to be erected. The building is perhaps the first non-military structure in the west that has been designed to withstand atomic "fallout." The contractor gave careful study to the most time-saving methods. Symons Steel-Plys proved to be one of the principal time-savers. They were used on all major construction and were also adapted for pouring of large, reinforced concrete beams that were set between steel columns for blast protection.

Complete "Air Route Traffic Control Center" story sent *free* upon request. Symons Steel-Plys can be rented with purchase option.

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MARCH, 1960

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VOLUME 42 NUMBER 3

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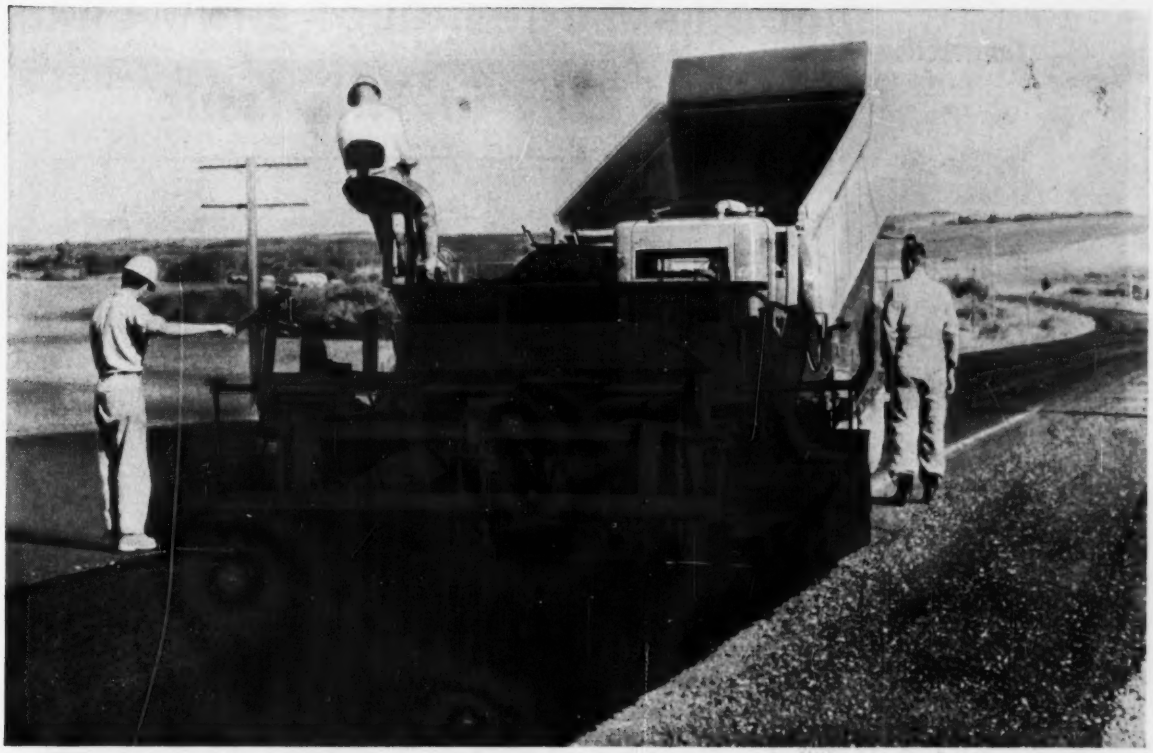


Only a *VIBROmatic*® can lay a mat like this

Smooth . . . dense . . . and compacted *from the bottom up!*

Such mats were never possible until development of the Pioneer *VIBROmatic* Paver which operates on an entirely different principle than traditional type pavers.

The Pioneer Paver *oscillates* and *vibrates* the material into place.

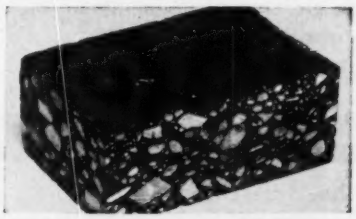
This is accomplished through use of an oscillating screed which operates together with a high-speed, heated vibrating compactor. Working in conjunction, they meter out the material and pre-compact it.

Result: a mat with virtually no voids and with uniform density from bottom to top . . . a pre-compacted mat which can be rolled *immediately* without undue displacement of the mixture . . . a mat which needs less rolling to attain the desired degree of final compaction.

Quality of mat is outstanding whether the *VIBROmatic* operates at high speeds or low. It has laid smooth, uniform mats in excess of 300 tph at speeds up to 84′ per minute, 1½″ thick and 12′ wide.

OTHER FEATURES Greater visibility and handy controls make the *VIBROmatic* the easiest-of all-pavers to operate. Simple design, accessibility, and fewer moving parts make maintenance a simple matter.

If your future plans call for paving work, it will pay you to learn how the *VIBROmatic* will let you submit lower bids . . . and at the same time, help you make a nice profit.



This photo of cross section of *VIBROmatic*-laid mat tells the story. Note uniform compaction and distribution of material *from the bottom up.*

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ON THE COVER

A Caterpillar 583 pipelayer pulls a 30-bbl Morris-Young-Owens dope kettle feeding a CRC coating machine for Western Pipe Line Inc. The Austin, Tex., contractor is looping 50 mi of natural gas line for Tennessee Gas Transmission Co. near Bedford, Ky. A feature of the job is that the pipe is placed in the ground unwrapped: TGT engineers believe they get better results by increasing the final dope coat from 3/32 in. to 3/16 in. and omitting the usual paper wrapping.

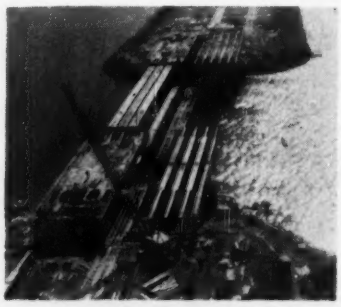
DEPARTMENTS

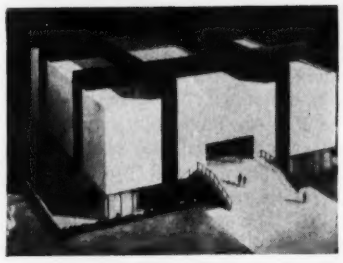
NEXT MONTH

Delayed for several months by the steel strike, erection of the retractible dome roof of Pittsburgh's Civic Auditorium is now progressing rapidly. A curved box-girder cantilever arm anchored by a tie-back truss supports the 415-ft-dia dome. Movable leaves will ride on tracks set on top of a ring girder to retract the dome of the big auditorium.

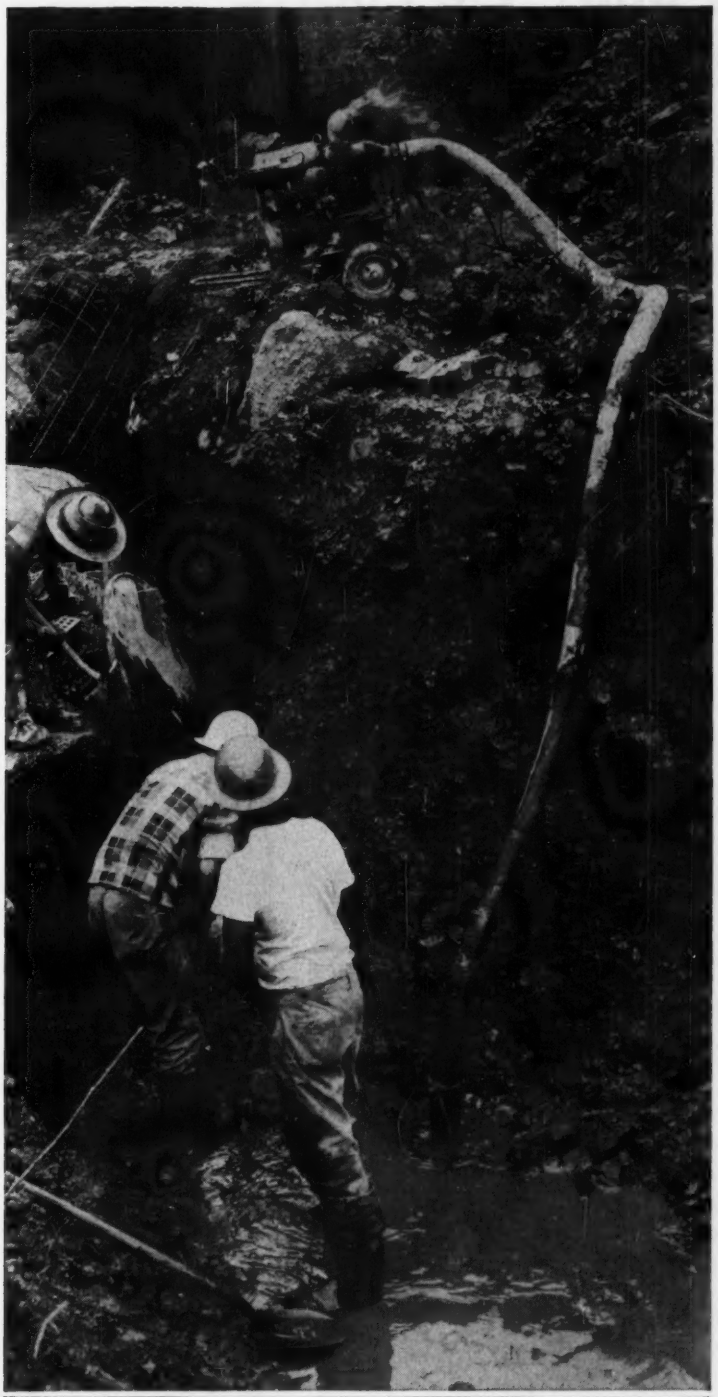
Photo Credits — 163 (top), 165 (bottom right) Fred Winchell.

Pay Dirt in This Issue





HANDLE THE TOUGHEST PUMPING JOBS WITH EASE!



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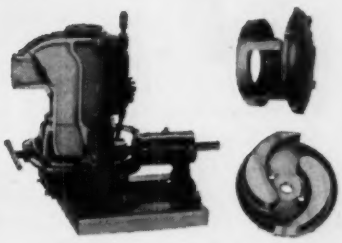
Pumps for Contractors

Completion dates . . . equipment failure . . . bad weather . . . water problems . . . headaches that harass as you push to get the job done. You just can't afford to have trouble.

Dependability takes on its full meaning when these rugged Gorman-Rupp Pumps are on the job. Simple design, rugged construction—and the performance, even under brutal treatment, is completely reliable. You know you can keep the toughest jobs going with these extra heavy duty units.

See these pumps at your Gorman-Rupp Distributor. They're built to serve you for years.



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160 GPM MODEL 12B2	350 GPM MODEL 13A2	600 GPM MODEL 14A2	1400 GPM MODEL 16A2
			

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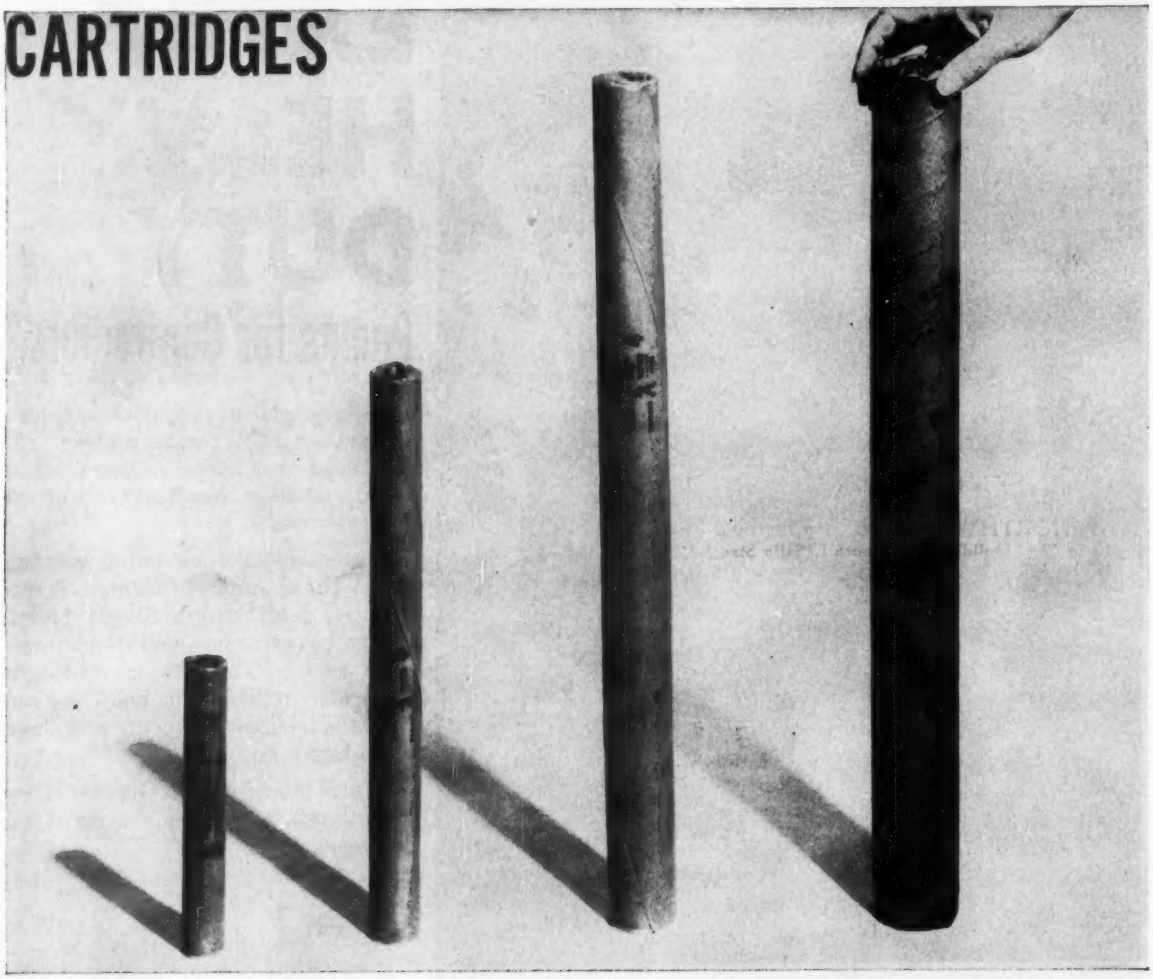

The Hercol series of low-cost, cap-sensitive, high-ammonia-content explosives are now available in cartridges of small diameters and standard lengths, as well as in the larger diameters and special packings.

The ability of Hercol to produce excellent fragmentation, its water resistance, Class 1 fumes, and high cartridge count—plus its low cost—have already been proved to the economy-minded quarry and open-pit operator.

Now that Hercol is manufactured in the smaller diameters, with Class 1 fumes, these same economies are available to the underground operator.

Contact the Hercules sales office nearest you or ask your Hercules representative for more detailed information on how Hercol can reduce blasting costs for you, too.

Properties of Hercol

	Hercol	Hercol 2	Hercol 4	Hercol 6
Fumes	Good	Good	Good	Good
Cartridge count—1¼ by 8-in. cartridges per 50 lb.	130	120	140	165
Cartridge diameter, in.	4 to 8½	1 to 3½	1 to 3½	1 to 3½
Weight strength, %	70	68	68	68
Cartridge strength, %	48	50	34	19
Water resistance	Fair	Good	Fair	Fair

A special grade of Hercol is formulated for seismic "pattern shooting" when the drill-holes are relatively dry.

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Get the Job Done!

THE job is a pipe line in New Jersey. H. C. Price is the contractor and "Mike" Arsenich, in the 25-D Northwest Pullshovel, is clearing out rocky plugs that stopped a trencher and another make of Pullshovel. Another such plug is visible in the distance. When other equipment is stopped, the Northwest gets the job done.

Operators and contractors have found Northwest Pullshovels outstanding. They make both the hard and easy jobs easier.

There is a wide range of capacities to choose from — from the big 2½ yd. 95 down to the ¾ yd. Model 25-D.

Get a Northwest man to give you the whole story. Ask for a catalog on the size machine you need.

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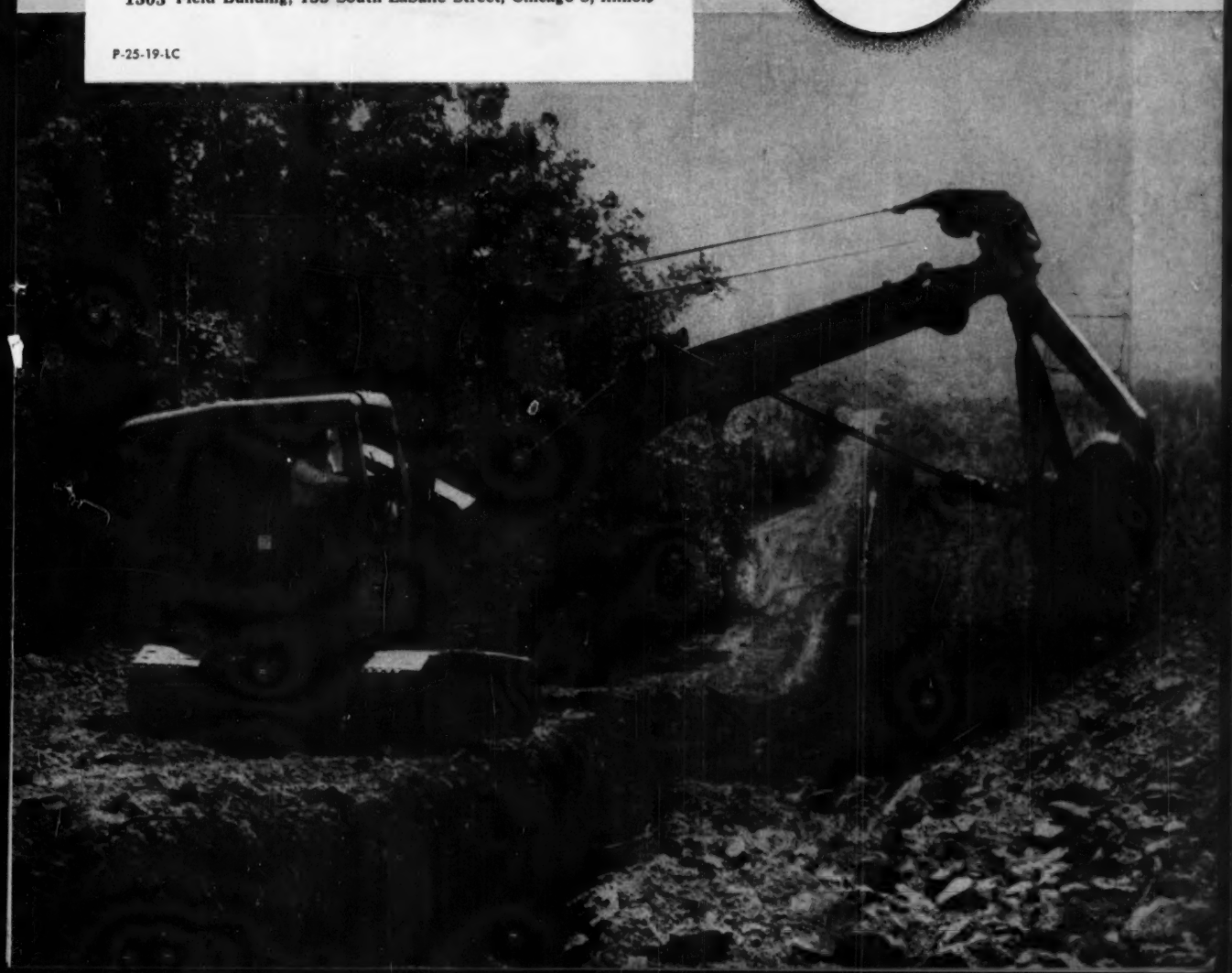

THE TUNNEL

Concrete Is Pumped Into Forms around tunnel walls and ceiling. Linking the towns of Duty and Carbo, Virginia, the 8,240 foot tunnel required removal of 170,000 cu. yds. of earth, used 60,000 cu. yds. of concrete.

Ralph E. Mills Company
Frankfort, Kentucky

AT SANDY RIDGE

To build a railroad lifeline, they needed a petroleum lifeline, and they got it from Cities Service

The time was 5:20 P.M.—the end of a warm May day.

Far below in the town of Duty, people headed quietly toward home and supper. But here on remote Sandy Ridge—here, high in the Alleghenies of Western Virginia, excitement reigned.

Suddenly, the mountain shook with a resounding explosion. 600 cubic yards of earth and rock came shattering to the ground. Phase One of the Tunnel at Sandy Ridge had ended.

A BORE 8,240 FEET LONG, a bore which required removal of 170,000 cubic yards of earth was complete. Phase Two, the pouring of 11,000 cubic yards of concrete flooring and the laying of track to link the towns of Duty and Carbo, could begin.

The Ralph E. Mills Company, contractor for the entire job, was plainly satisfied. For throughout the 13 months of Phase One, its men and equipment had worked without interruption in this inaccessible location where supply problems could have been acute—particularly petroleum.

But Mills had taken great pains beforehand to assure that there would be no supply problem. Combing the list of local fuel distributors, they had eventually settled upon J. F. Bolton, Cities Service distributor in St. Paul, Virginia.

"We couldn't have made a better choice," says a Mills official. "Bolton took that Cities Service truck over some of the toughest terrain we've ever seen a fuel distributor travel. Mud, snow, ice, jagged rocks—nothing could stop him. And always he'd arrive with a complete stock of all the Cities Service products we needed. Moreover, despite the rugged operating conditions of our equipment, we never had a lubrication failure using his Cities Service products."

If *you* have a tough job coming up—and if you're going to need this kind of service and product performance, be sure to contact your nearest Cities Service distributor and let him help you with your planning. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

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QUALITY PETROLEUM PRODUCTS

Grinding Up Side of Cliff was typical of obstacle course that Cities Service distributor J. F. Bolton had to run in order to supply the Ralph E. Mills Company. Neither mud, snow, nor ice could interrupt delivery.

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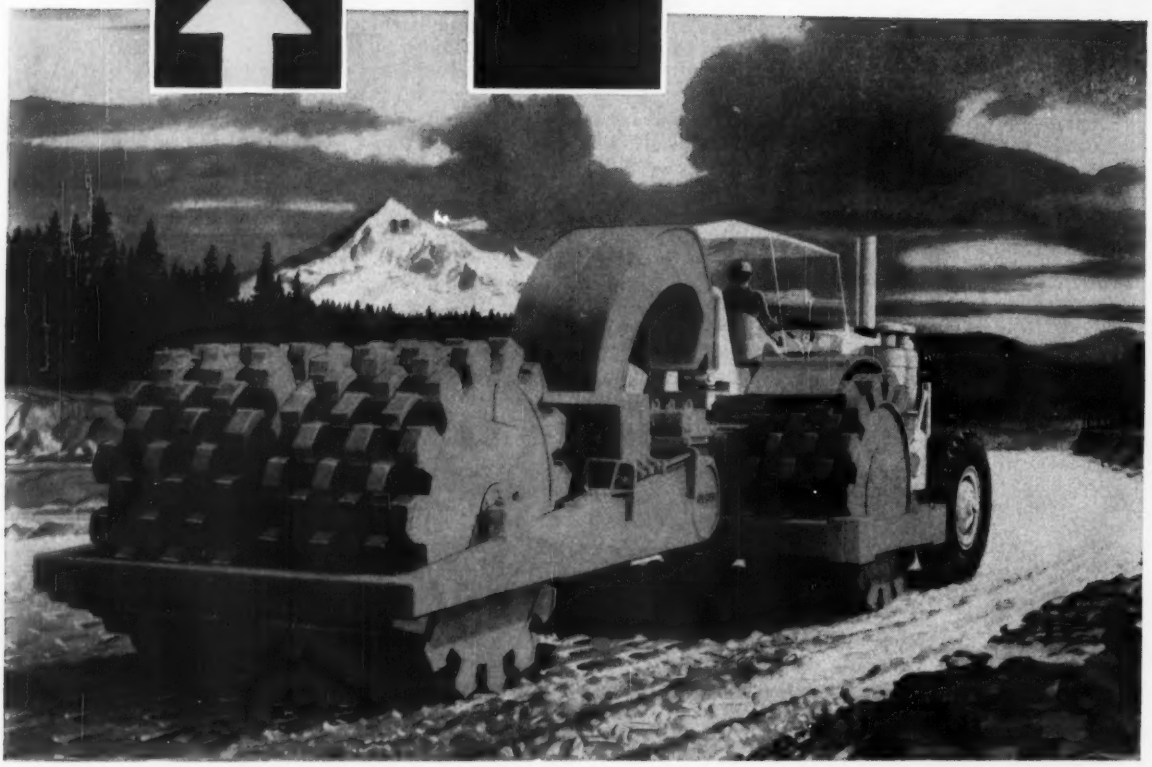
Milemaster Gasolene	An exceptionally high-powered regular gasolene with built-in protective features.
Cities Service Diesel Fuel	Clean-burning, economical.
Trojan MP Gear Oil	An excellent extreme pressure lubricant that gives maximum protection to gears.
Trojan H-2 Grease	A multi-purpose lubricant suitable for wheel bearings, chassis, and water pump. Gives outstanding protection against water and rust. Reduces inventory. A lesser amount is required for each lubricating job.
Sentry No. 1	A good general lubricant which Ralph E. Mills Company has found excellent for forms.
Sentry No. 4	A superior engine and bearing oil which Mills found particularly suitable for its air compressors.

HYSTER



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P. O. Box 328 • Peoria, Illinois

Construction News From Washington

Washington, D.C.
March, 1960

Peace Plan in the Works

Leading contractors and AFL-CIO union chiefs are serious about efforts to agree on a permanent strike truce in the building industry. It is part of a joint management-labor program to eliminate wasteful costs in construction.

The goal is to write an effective plan and win approval within a two-month period. The framework is already laid out. It calls for joint labor-management boards, with an outside referee to sit in on all disputes and either make recommendations or arbitrate the differences. The appeals board route for all disputes—from wage negotiations to grievances—would be written into all construction labor contracts. The plan would be entirely voluntary, but once the parties sign up, they would be bound by the board's decisions.

The plan is now being circulated among local craft unions and contractors. The results—expected to be affirmative—will be returned to the Construction Industry Joint Committee, headed by Harvard Professor John Dunlop, to finish working out the details.

Gray's Successor

Heads of the 17 craft unions that make up the AFL-CIO Building Trades Department picked a civic leader with plenty of political savvy to replace Richard J. Gray, who resigned as president of the department last month.

He is Cornelius J. Haggerty, executive secretary-treasurer of the California State Federation of Labor. Haggerty started as a lather in California, became president of his local, served as vice president of the international and as secretary of the Los Angeles Building Trades Council. He was a member of the the state's Selective Service Board of Appeals, the Advisory Committee of the Office of Price Administration, and the Manpower Commission.

He has had close relations with the last three governors of California—two of them Republicans, the other a Democrat.

Jurisdiction Storm Clouds

The old craft-industrial union rivalries are stirring again—with a new twist. The cause is automation and modern production methods. Competition is breaking out first in chemical and petroleum plants over plant maintenance jobs. Production unions have handled routine maintenance work. New equipment, however, is demanding more skilled workers.

continued on next page

Now, craft unions are bidding for this work through the outside maintenance contractor. Construction unions have already moved into half a dozen chemical phosphate plants and are challenging in the petroleum industry. It hasn't spread yet, but the United Steel Workers' David J. McDonald and United Auto Workers' Walter Reuther are up in arms at the Building Trades unions.

Politics and School Construction

Election year politics have brightened materially the chances for passage of a big new program of aid to education. Right now it's difficult to see whether it will turn out to be a construction-only program or whether the legislation will leave it to the states to decide how they want to spend their money.

The Senate has approved a $917-million-a-year program which could go either for construction or for teachers' salaries. The House version may be both smaller and different, but it also is bound to be something considerably more than President Eisenhower asked. What the President recommended was just a program of help in paying off the principal and interest on bonds issued by the school district.

The race and religious issue—a stumbling block heretofore—was solved in the Senate by writing a provision that permits the states to spend the federal money for any purpose which is legal under state law.

President Eisenhower is almost sure to veto the bill the Congress passes. But the Democrats are hopeful of passing the measure over the President's veto. In the Senate the bill passed by a vote of 67 to 26, and Democrats are confident they could muster the same over-riding vote again. In the House, the vote would be much closer, but the Democrats have hopes of picking up a score or so of votes from the 115 Republicans who voted against the bill a year ago.

Atomic Power Slowdown

Rising costs and financial troubles may slow the construction of nuclear power plants. Although John A. McCone, Chairman of the Atomic Energy Commission, is reporting optimistically to Congress of probable energy competition by nuclear power in 1968, some utility executives question whether heavy expense won't curtail the program. They cite such plants as the one under construction for Consolidated Edison in Indian Point, N.Y., which since 1955 has risen in estimated cost from $50 million to more than $120 million. The plant is scheduled for completion in 1961, but may not be ready then.

Talbert Trailers

CHALLENGES THEM ALL!

THE *Challenger* LINE

Drop and level deck trailers with capacities of 18 tons, 27 tons and 36 tons.

Only Talbert offers as standard equipment:

- Removable Gooseneck†—First, Best, Work Proven!
- 100% Man-Ten Hi Tensile Steel Construction!
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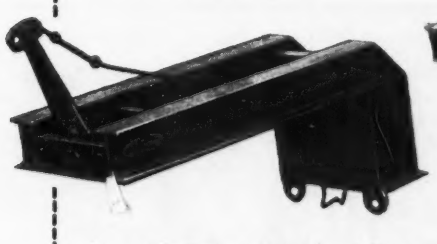
- Hendrickson Tandem—Finest Available!
- Telescopic Outriggers
- 20 Inch Wheels
- Large Diameter Air Brakes and many extras

TEAR AD HERE



SIX MODELS TO CHOOSE FROM
Shown Above: Talbert's TD-27-RG

Capacity 27 Tons **$5,502***

Prices and Specifications subject to change without notice.

TEAR OUT THIS AD! THEN SHOP AND COMPARE!

FROM THE GROUND UP . . . the specifications of Talbert's CHALLENGER trailers beat every "competitive" trailer in the front loading line.

FROM FIRST COST ON . . . Talbert's CHALLENGER trailers cost less than any "competitive" trailer in the front loading line.

So . . . go ahead! Shop and compare! You'll find a Talbert CHALLENGER is your best buy!

Don't wait! Call or write today for complete information on the CHALLENGER trailer you need!

* Plus F.E.T. †U.S. Pat. 2,489,112 Can. Pat. 472,905

Talbert Trailers, Inc.

7910 West 47th Street
Lyons, Illinois Hickory 7-3169

LUBE LOGIC

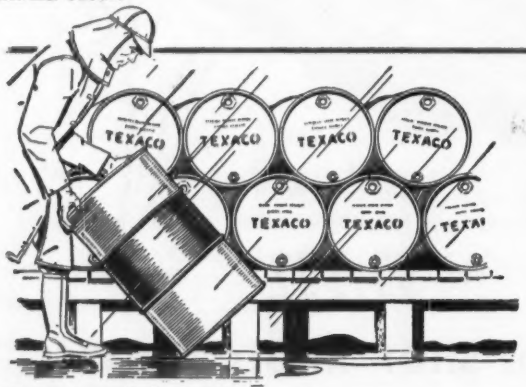
Six tips to

How high is your hidden cost of maintenance?

You may not realize how many extra maintenance dollars you spend when you keep many different lubricants on hand. (Six are often all you need to cover all major maintenance.) You pay extra for inventory. You pay extra for storage and handling. It costs you more in paperwork to order. And you'll have to figure the wasted cost of equipment parts and downtime if misapplication should occur.

The Texaco Lubrication Plan helps you reduce or even eliminate these hidden costs. That's because it provides the minimum number of *proven* multi-purpose and special lubricants, tailored to your job requirements.

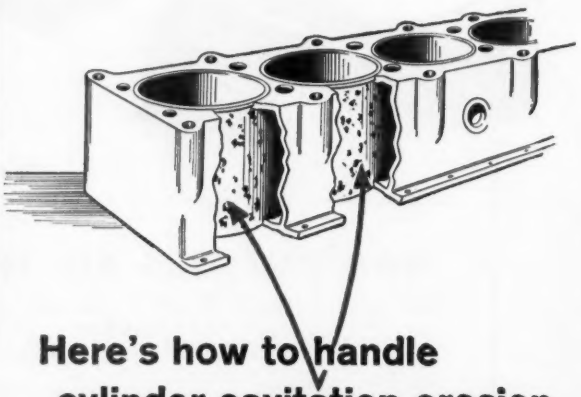
You'll do yourself a favor when you check with a Texaco Lubrication Engineer. He'll carefully plan your lubrication needs—then follow them up to see that your lubrication problems are taken care of fast.



The inside story on outside storage

You're short-changing yourself if you skip these simple precautions: drums stored outdoors should be placed on their sides. When stored on end, expansion and contraction through temperature changes can suck in rain water that collects on top of the drum.

Want to warm up lubricants that have become stiff from cold? *Don't* heat them with an open flame. You might melt the sealing compounds, and the drum will leak. You might also damage the product with too much heat in one spot. Put the drum indoors for a while before using.



Here's how to handle cylinder cavitation erosion

High pressure cooling systems in use in most supercharged diesels are subject to coolant aeration. This aeration can cause cavitation, leading to serious cylinder liner corrosion-erosion, unless a rust preventive is added to the water. A good antifreeze (like Texaco PT antifreeze) will do the job in winter—but in summer a 1% to 2% solution of Texaco Soluble Oil C will do a fine job. (Remember to flush out before you add antifreeze again.)

cut maintenance costs

OIL GAUGES SPEAK A LANGUAGE ALL THEIR OWN

Look to your oil gauge pressure for clues to a variety of potential engine ailments. For example:

LOW OR NONE

1. Oil pump pickup stuck high.

LOW

1. Clogged oil pump screen.
2. Excessive main, con-rod, camshaft or rocker-arm bearing clearances.
3. Clogged full-low filter, if by-pass isn't working.
4. Excessive dilution of oil with fuel.
5. Enlarged squirt holes.
6. Loose connections or cracks in oil line.

LOW OR ERRATIC

1. Faulty oil pump.
2. Res[illegible]iction in oil pan, or oil too viscous to keep oil pump intake supplied.

LOW OR HIGH

1. Faulty gauge.
2. Ineffective oil cooler depending on type, may keep oil too cold or provide insufficient cooling.

HIGH

1. Oil with viscosity too high for climate.
2. Sludge and contamination in the oil.
3. Clogged oil passages on the pressure side.

HIGH, LOW OR ERRATIC

1. Improper setting or failure of pressure relief valve.

ERRATIC, LOW, THEN NONE

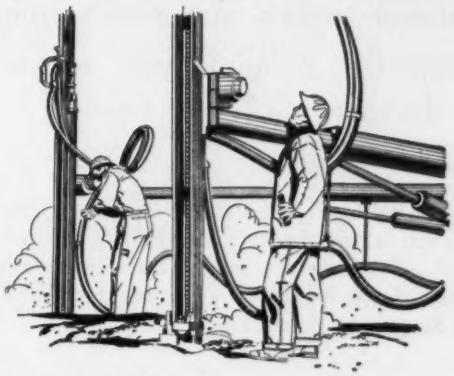
1. Crankcase oil level just at or below oil pump pickup.

NO MOVEMENT OR DELAYED ACTION

1. Clogged line to gauge.

Don't let engines foul up!

If the fuel injector on a diesel drifts off or "dribbles," incompletely burned fuel will contaminate the crankcase. The result will be plenty of smoke—and probably engine trouble. The injector should be fixed immediately—but if it can't be, start shortening drain periods to remove the damaging oil-fuel mixture. Also, use an oil with full detergent and dispersion properties to keep other undesirable products out of the engine.



New product for rock drill couplings

Actually, it's an old friend, Marfak Heavy Duty #2, in a new application. According to the raves from customers who've tried it, the lubricant works better on rock drill couplings than anything they've ever used.

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

TEXACO

Throughout the United States

Canada • Latin America • West Africa

There's a reason WHY in MacWHYte Wire Rope*

It brings out the best in your equipment!

Just as you use specialized equipment for a particular job, it pays to use the right kind of wire rope designed for that equipment.

All wire rope isn't the same. There are changes in the construction of wire rope . . . which aren't obvious to the eye . . . but can seriously affect the way it will work on your equipment. Because all equipment isn't the same, different types of rope are required because of basic design variations.

With this in mind, you can see the reason "why" Macwhyte offers such a wide variety of wire rope:

* Every foot of wire in Whyte Strand is specially drawn, cold-worked by Macwhyte in their own wire mill. Complete processes — from raw material to finished wire for rope — are under the watchful eyes of Macwhyte metallurgists.

* Product engineers determine the exact number, size, and relationship of the wires needed to meet the requirements of your equipment. You're sure of the correct size, strength, and flexibility.

* Special lubrication is available in accordance with the needs of the equipment or the type of service in which the rope will be used. The tenacious lubricants provide just the necessary protection — are unaffected by heat or cold, dry or wet conditions.

* Entire wire and rope mill operations are concentrated on the making of wire rope in a thousand and one sizes, grades, and types . . . to give you the rope you need.

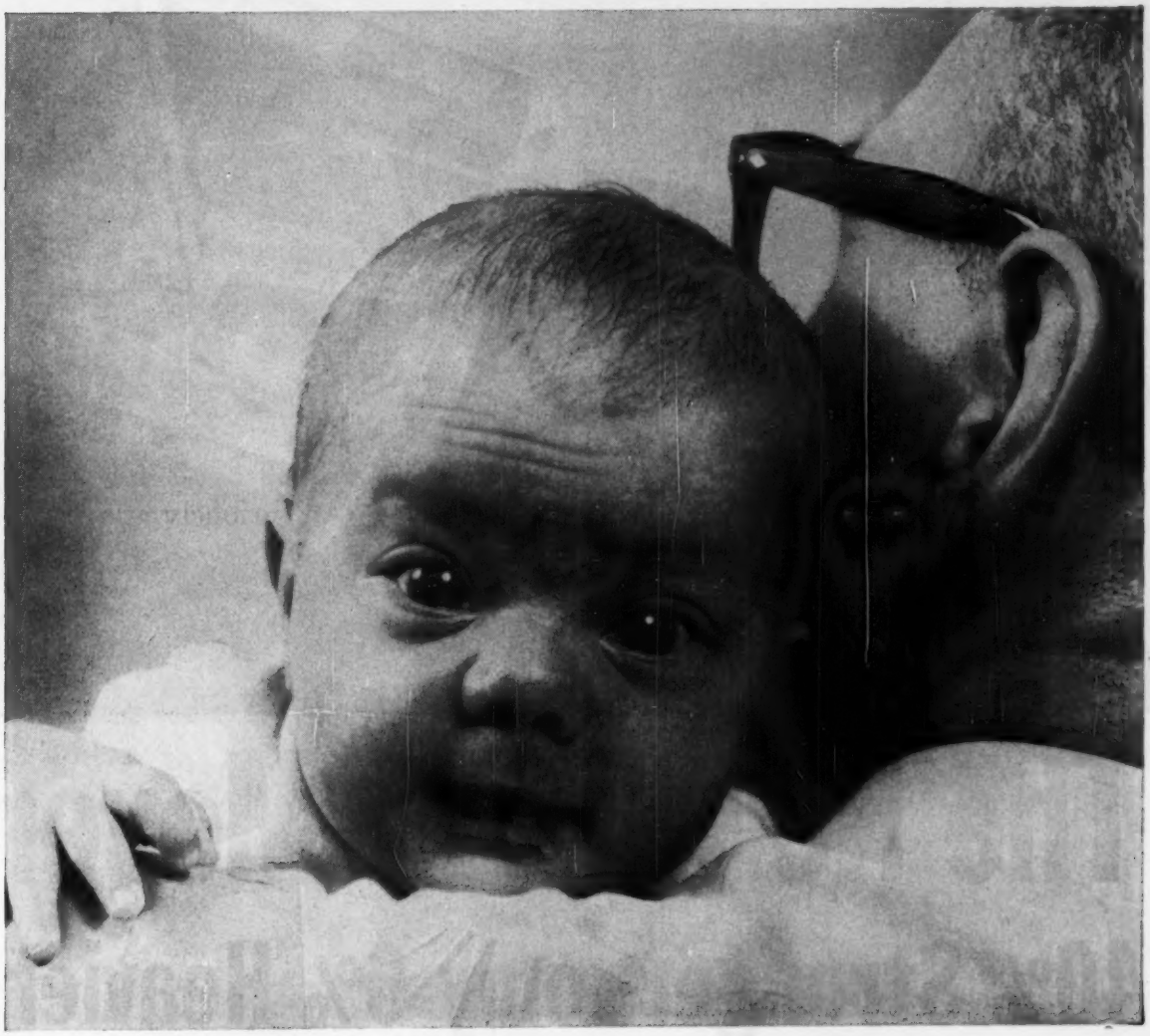
Result: Whyte Strand wire rope is literally "custom made" for shovel hoist rope, dragline, clamshell crane rope, boom hoist line, dozer rope, scraper rope, contractors' hoist and derrick rope, overhead cranes, cableway excavators, and winch lines. If you'd like to check the type of rope recommended for your equipment, send for bulletin 5702 — free for the asking.

491

MACWHYTE Wire Rope COMPANY

2900 Fourteenth Avenue, Kenosha, Wisconsin, U. S. A.

THEY TRUST THEIR BABIES TO FRAM!



More manufacturers protect their precious new products with FRAM than with any other filter. See why:

The business reputation of an engine manufacturer is at the mercy of dirt and contaminants that can ruin his products after they are sold. For fullest protection more manufacturers install Fram *at the factory!*

With today's rapidly rising maintenance costs it's just plain good sense to continue to protect your equipment with Fram Filters. Leading suppliers carry Fram Filters—be sure to specify Fram Filters!

FRAM
OIL · AIR · FUEL · WATER
FILTERS

FRAM CORPORATION, Providence 16, R. I.

GOODYEAR

A MODERN RIM FOR

The New Earth-Mover

40% Stronger—only 6% Heavier

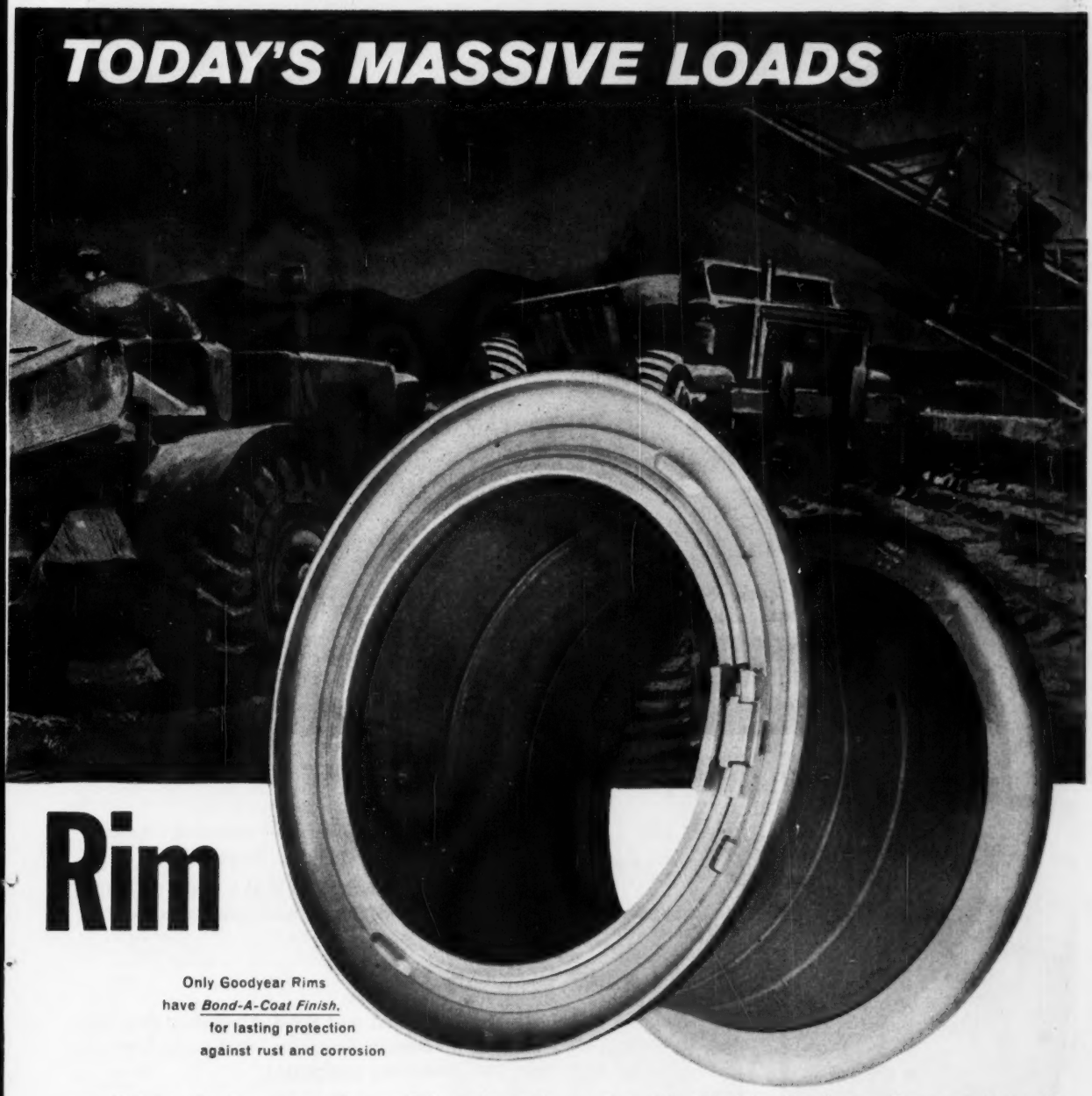
Today's earth-movers are carrying bigger loads than ever—and moving them faster, too.

To meet the added strain imposed on rims, Goodyear, long-time leader in rim development, has introduced a complete new line of Earth-Mover Rims. Although 40% stronger, these new rims are only 6% heavier.

With Goodyear rims you enjoy such added benefits as a heavy-duty bead seat band driver—to prevent slipping under severest operating

Buy and Specify RIMS by GOOD

TODAY'S MASSIVE LOADS



Rim

Only Goodyear Rims
have *Bond-A-Coat Finish,*
for lasting protection
against rust and corrosion

conditions. And you get the positive air seal provided by Goodyear's famous Tru-Seal.

Goodyear makes rims in widths up to 37″ and in diameters up to 49″. To prevent premature tire and rim failure, it pays to buy and specify rims job-fitted by Goodyear. See your local rim distributor, or write: Goodyear, Metal Products Division, Akron 16, Ohio.

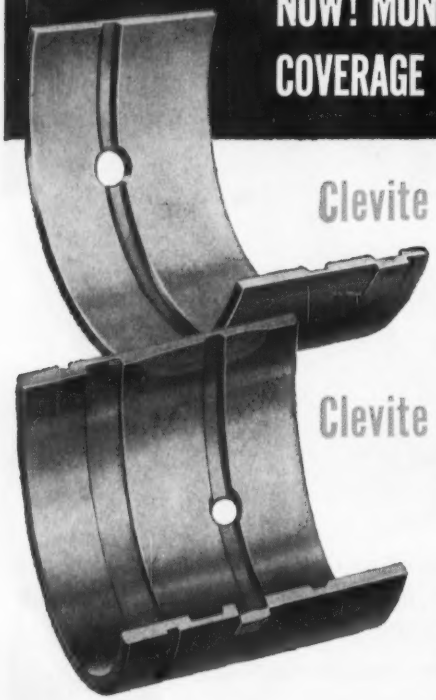
Send for Free Goodyear Rim Catalog
—84 pages of facts and pictures on Goodyear's complete line of rims for every type of vehicle.

GOODYEAR

More tons are carried on Goodyear Rims than on any other kind

Tru-Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

NOW! MONMOUTH OFFERS COMPLETE ENGINE BEARING COVERAGE TO THE CONSTRUCTION FIELD



Clevite 77 BEARINGS

CLEVITE 77, with patented cast copper lead tri-metal construction, provides greater load carrying capacity, longer life.

CLEVITE 77 (the bearing preferred by O.E.M.) saves time and money with more hours of service, lower maintenance costs.

Clevite ALUMINUM BEARINGS

Now! A full line of Steel Backed and Solid Aluminum bearings (identical to original equipment in design and materials) is available for ALL special earthmoving equipment.

A complete range of undersizes will give you up to four regrinds, extending crankshaft life.

The coverage, availability and service you receive from your NAPA Jobber makes it easy for you to use the best —CLEVITE—from the world's leading original equipment manufacturer.

For your nearest jobber, contact one of the NAPA warehouses listed on opposite page

MONMOUTH *Engine Bearings*

CLEVITE SERVICE: Cleveland Graphite Bronze • *Division of Clevite Corporation* • Cleveland 3, Ohio

Monmouth
ENGINE BEARINGS

NAPA Atlanta
200 Baker Street, N.E.
P. O. Box 6006, Station H
Atlanta, Georgia

NAPA Birmingham
500 South 23rd Street
Birmingham 2, Alabama

NAPA New England
325 Vassar Street
Cambridge 39, Mass.

NAPA Buffalo
1339 Main Street
Buffalo 9, New York

NAPA Charleston
410 58th Street, S.E.
Charleston 31, West Virginia

NAPA Charlotte
2711 Wilkinson Boulevard
Charlotte, North Carolina

NAPA Chicago
515 West 35th Street
Chicago 16, Illinois

NAPA Cleveland
1458 East 55th Street
Cleveland 3, Ohio

NAPA Columbus
845 Grandview Avenue
Columbus 8, Ohio

NAPA Dallas
1719 North Harwood
Dallas 1, Texas

NAPA Denver
P.O. Terminal Box 5386
Denver 17, Colorado

NAPA Des Moines
12th & Mulberry Streets
Des Moines 9, Iowa

NAPA Detroit
101 Selden Avenue
Detroit 1, Michigan

NAPA Fresno
666 L Street
P. O. Box 1026
Fresno 1, California

NAPA Grand Rapids
323 Ionia Avenue, N.W.
Grand Rapids 2, Michigan

NAPA High Point
P. O. Box 5029
Richmond, Virginia

NAPA Hawaiian
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P. O. Box 1599
Honolulu 6, Hawaii

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1717 Pierce
Houston 3, Texas

NAPA Indianapolis
424 North Illinois Street
P.O. Box 635
Indianapolis 4, Indiana

NAPA Jacksonville
1090 Haines Street
Jacksonville 1, Florida

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2701 Main Street
Kansas City 8, Missouri

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600 East Washington Boulevard
Los Angeles 15, California

NAPA Louisville
Brooks & Jacob Streets
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Louisville, Kentucky

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Memphis 2, Tennessee

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Miami, Florida

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767 N. Jackson Street
Milwaukee 2, Wisconsin

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Minneapolis 3, Minnesota

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855 Baronne Street
New Orleans 13, Louisiana

NAPA New York
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NAPA Oakland
401 27th Street
Oakland 12, California

NAPA Oklahoma City
700 South Western
Box 1821
Oklahoma City 4, Oklahoma

NAPA Omaha
2027 Harney Street
Omaha 2, Nebraska

NAPA Philadelphia
1600 Hunting Park Avenue
Philadelphia 40, Penna.

NAPA Phoenix
324 West Adams Street
Phoenix 1, Arizona

NAPA Pittsburgh
5620 Penn Avenue
Pittsburgh 6, Penna.

NAPA Portland
3241 N. W. Industrial
Portland 10, Oregon

NAPA Richmond
1302 MacTavish Avenue
Richmond 20, Virginia

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28 S. W. Temple Street
Salt Lake City 1, Utah

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710 Broadway
San Antonio 5, Texas

NAPA San Diego
1123 Island Avenue
P. O. Box 829
San Diego 12, California

NAPA San Francisco
25 Division Street
San Francisco 3, California

NAPA Seattle
2700 4th Avenue, South
Seattle 4, Washington

NAPA Spokane
126 South Sheridan Street
P. O. Box 1444
Spokane 6, Washington

NAPA St. Louis
3301 Locust Street
St. Louis 3, Missouri

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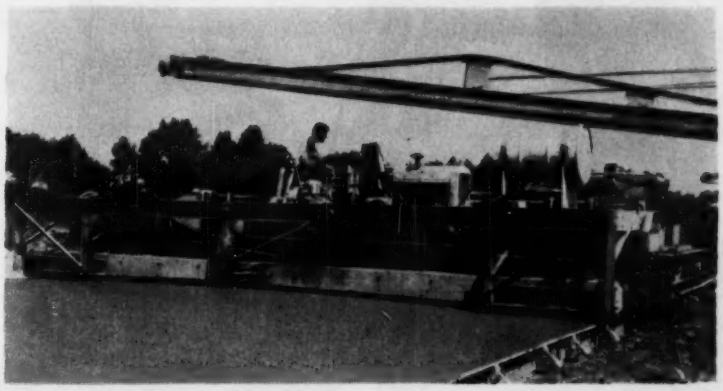
Your NAPA Jobber is a Good Man to Know!

Job Talk...



Screed on Spreader Replaces Finisher

A power-driven screed attachment mounted at the rear of a concrete spreader eliminates a finishing machine in the paving train of Harrison Construction Co., Pittsburgh, Pa.

Blaw-Knox added the screed to the spreader last spring. Since then the contractor estimates he's saved $1,000 per month by eliminating a finishing machine and its operator. The attachment also cuts down on tears in the surface of the pavement—a major cause of paving re-runs.

A welded double channel beam makes a rugged supporting frame for the drive and lift mechanism. The design positions rollers for maximum push action against the screed. The spreader's 58-hp gasoline engine powers the screed attachment, which is controlled by the spreader operator.

Compressed Air Loosens Form Panels

Using compressed air to strip steel dome forms, Utah Construction Co., San Francisco, Calif., rushed a 1,259-car parking garage to completion in just 11 months.

Set on 2x8 joists on top of 4x6 stringers held by 4x4 posts, the pans each had a hole punched in the middle. A small nail blocked the hole during concreting.

Two-man crews stripped the forms at a rate of one a minute. They jetted a stream of compressed air under the pan from a nozzle at the end of a 30-ft-long, ⅜-in. hose. The 80 lb of air pres-

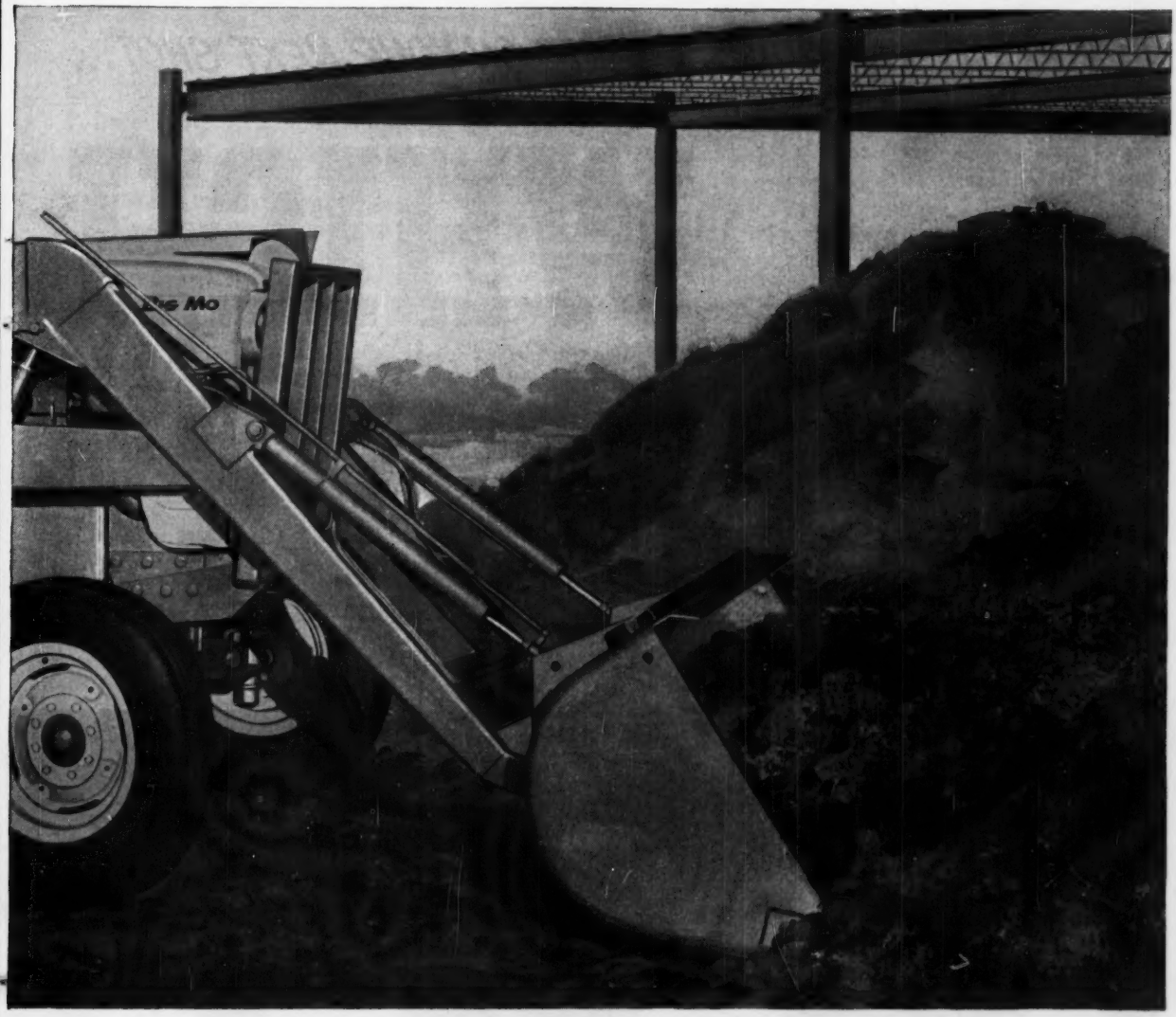
continued on page 26

BIG MO Tractors

Big MOLINE capacity... matched

Real Backhoe capacity— Moline-built for easier, safer operation

This powerful, fast-cycling backhoe digs 12 ft. 6 in. at any point in a 190° swing with 7,000 lbs. of digging force at point of bite. Hydraulic wrist-action bucket digs straight sides and square corners. Offset operator seat pivots with the boom to allow continuous, unobstructed visibility of bucket throughout operating arc. Individually controlled hydraulic outriggers, sealed ball bearings at all major wear points and wide range of bucket types are typical advantages.



backhoe-loader...shuttle reverse

SPEED YOUR WORK CYCLE with the powerful new BIG-MO TRACTORS and *no-clutching shuttle reverse!* You load under full power . . . back away fast—dump . . . and you're in for the next bucketful while other tractors are lagging far behind! It's *all* done with a flip of the lever!

And the BIG-MO TRACTORS come equipped with *matched* backhoe and ¾-yard loader—you can get other *matched* equipment if your jobs require it. Parts and service are immediately available from your nearby Moline dealer.

BIG-MO TRACTORS are available in the "500" series with mechanical shuttle and standard transmission, or in the "600" series with Moline toe-operated hydraulic shuttle and torque converter drive. See the BIG-MO backhoe-loader at your Moline Industrial Dealer or mail coupon today!

ROGER HIPWELL—PHONE WEST 8-2771
Industrial Sales Manager
Minneapolis-Moline, Hopkins, Minnesota

☐ Send me name of my Minneapolis-Moline Industrial Dealer

☐ Send me catalogs on the new BIG-MO TRACTORS.

NAME_____

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CITY_____ ZONE____ STATE_____

MINNEAPOLIS MOLINE*

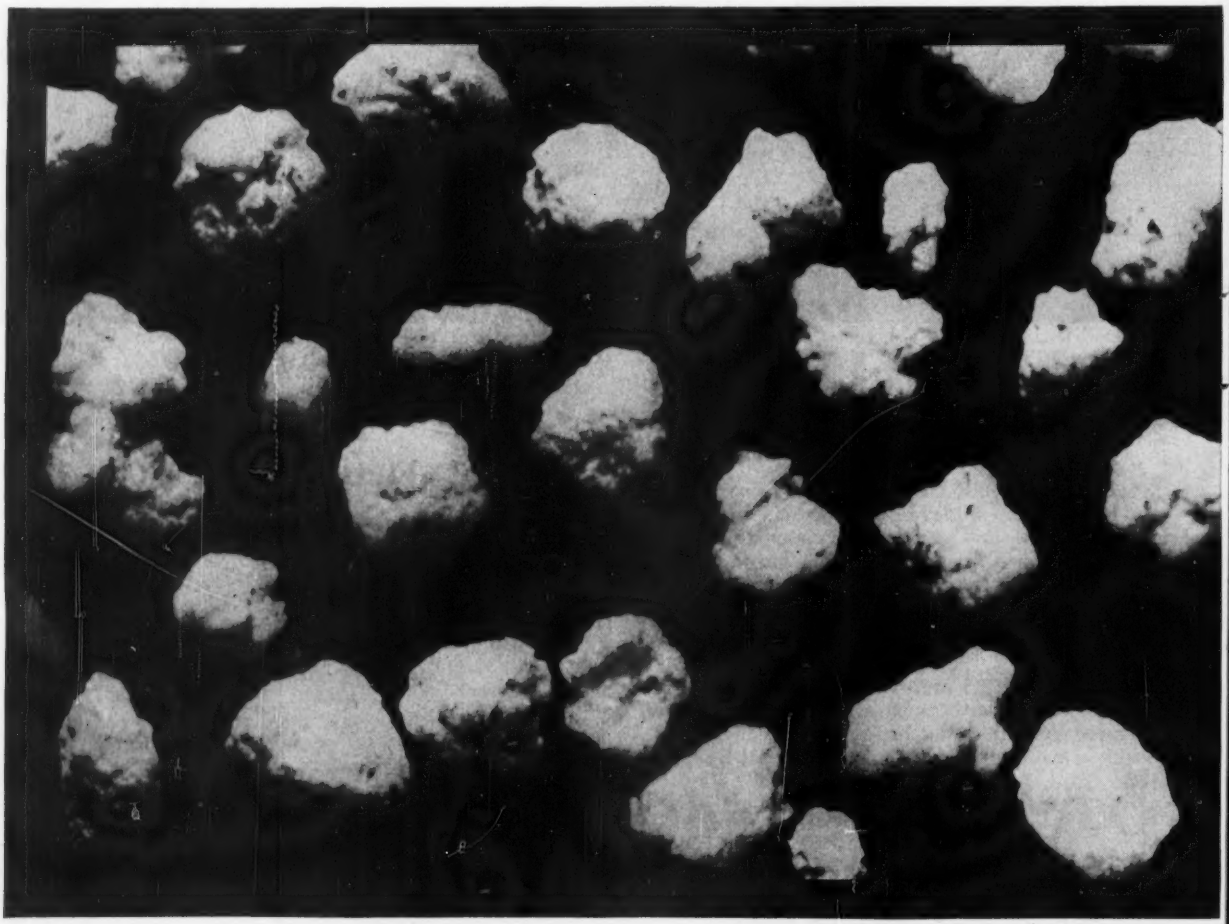
The fastest-growing line of industrial equipment!

*Moline Dealers give the best part service in the industry.

FOR REALLY EFFECTIVE RESULTS ON YOUR NEXT SHOT...

WHICH EXPLOSIVE?

This is a photographic enlargement of Atlas Pellets.



New explosives, blasting agents, and techniques are being developed at an ever increasing rate. Operators are using these developments to find new answers to the old problems of getting more payload work from shovels, trucks, crushers, conveyors . . . all their equipment all along the line. And they are finding that the lowest true blasting costs depend upon determining *which explosive* and which blasting methods combine to give the best breakage, displacement, and control at the lowest overall cost.

For example, are you familiar with one of the newest developments . . . ATLAS PELLETS? They are a new form of ammonium nitrate designed especially for blasting. They are porous, compact particles which have oil absorption characteristics equal to that of prills. Yet they have higher density for more efficient blasting. And they are exclusive with Atlas. But just because they are new, they are not necessarily the best explosive for your operation. Ask your Atlas representative about Pellets, and about the complete Atlas Line. It's his job to help you decide which explosives make the right combination to give you really effective results on your next shot.

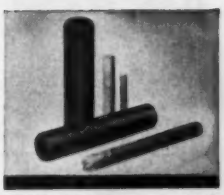
There is only one way to look at explosives costs, and that is: which explosive will give you the most payload service from all your equipment? Our blasting cost chart, slide rules and technical literature are designed to help you do exactly that. Ask your Atlas Representative about them . . . or, write directly to:

ATLAS POWDER COMPANY
Explosives Division, Wilmington 99, Del.

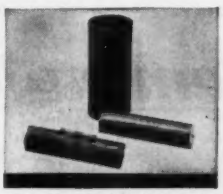
ATLAS EXPLOSIVES

When you use the right combination, all your equipment moves in sooner... works faster... produces more.

ATLAS PELLETS, a new form of ammonium nitrate, have both the density and sensitivity required for efficient ammonium nitrate blasting.



GIANT GELATINS are for high velocity shattering action. They are advantageous for extremes of wet work and for hard, tight shooting.



GIANT "75" PRIMERS have the wallop required for complete, efficient detonation of both field mixed and plant mixed blasting agents.

ROCKMASTER® electric blasting caps achieve the staggered action which has been so important in producing better breakage and control.

New Remington Model EV-26 CONCRETE VIBRATOR

Now the world's most reliable, simplest-to-use, motor-in-head vibrator and only 2⅝" in diam.

1. Heavy-duty, 6-ply hose with anti-slip finish. 3-wire cord anchored permanently inside.

2. Welded commutator leads plus thermal overload protection switch prevent motor burnouts.

3. Heavy-duty precision ball and roller bearings on motor shaft and tip.

4. Special Remington eccentric throws out 10,000 vpm with an extra-strong kick.

5. Carburized, alloy steel head with welded tip resists abrasion. Only 2¼" diameter for work in tight places.

Now with the new Remington Model EV-26 you get a motor-in-head vibrator of exceptional reliability. Remington backs the Model EV-26 with a six-month guarantee, and it has capacity for fast work in walls, floors, footings and beams. You can plug it into any 110-volt line. The powerful motor kicks over at 10,000 vpm. A positive, 2-button, waterproof switch is conveniently located near the operator's hand. A special overload switch protects against motor burnouts on both AC and DC current.

The new Model EV-26 is economical and easy to use in one-man operation. It comes in 7', 14' or 21' hose lengths with 25' of special heavy-duty cord. Ask your distributor to show you the new Model EV-26 and the complete line of Remington concrete vibrators.

FREE CONCRETE VIBRATOR BOOKLET!
12-page, fully illustrated booklet gives applications, construction details, specifications with description of shafts and accessories available. No obligation. . . mail coupon today.

Remington

Remington Arms Co., Inc., Bridgeport 2, Conn.
IN CANADA: Remington Arms of Canada Limited
36 Queen Elizabeth Blvd., Toronto 18, Ontario

DU PONT

--FREE POWER TOOL CATALOGS----------
Remington Arms Company, Inc., Bridgeport 2, Conn. CME-3
IN CANADA: Remington Arms of Canada Limited, 36 Queen Elizabeth Blvd., Toronto 18, Canada.

Please send free information on Remington Contractor & Industrial Equipment checked below:
☐ Concrete Vibrators; ☐ Flexible Shaft Machines; ☐ Air Tools; ☐ Chain Saws; ☐ Stud Drivers

Name_____ Position_____

Company_____

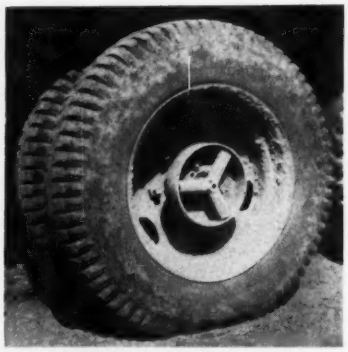
Address_____

City_____ Zone_____ State_____

JOB TALK . . .

continued from page 21

sure easily loosened the pan. Then the workmen lowered the pan a few inches, enough to get a hold with a claw hammer.



Odds and Ends Make Back-Up Alarm

An old auto brake drum, three short sections of 1-in. pipe, and a ball from a large ball bearing are all the materials a Midwest contractor needed to put together an effective back-up alarm for their trucks and other wheeled vehicles.

They welded a brake drum to the hub of a wheel and inserted within it the interconnected pipes with the ball bearing inside. When the vehicle moves at speeds of less than 20 mph, the free-falling ball bearing moves from pipe to pipe and clangs against the drum at the ends. At higher speeds, centrifugal force keeps the ball bearing motionless at the outer end of one of the pipes.

Safety Railing for Skyscrapers

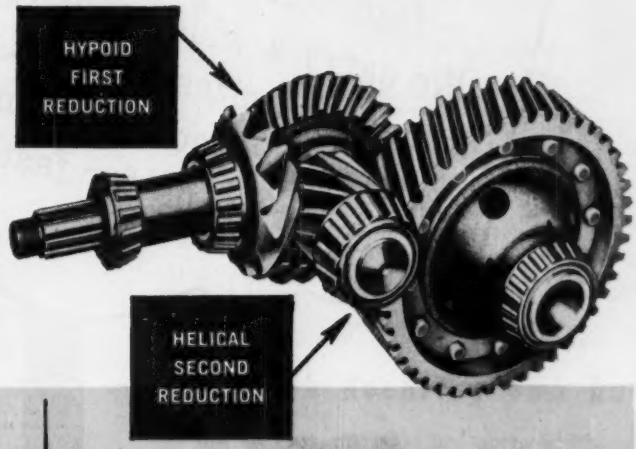
Pipe railings attached to the steel frame of the 60-story Chase Manhattan Bank Building in New York City protect workmen from falling into open shafts that will house elevators and conduits.

Safety engineer A. C. Dickinson of the Travelers Insurance Co. devised the system to replace timber barriers. Made of standard 1½-in. pipe, the railing is supported by vertical pipe sections clamped at the base to the steel beam at the edge of the shaft. The railings remain in place, even while the floor slab is poured, until the shaft is bricked up.

Heavy-Duty Hauling Jobs Are Easy With Timken-Detroit®

BALANCED HYPOID-HELICAL DOUBLE-REDUCTION AXLES

Timken-Detroit balanced hypoid-helical double-reduction gearing is unequalled for top performance and dependability. Outstanding advantages that make it the choice of heavy-duty equipment manufacturers and operators are: big, husky gears . . . greater flexibility in gear ratios . . . balanced gear set loadings . . . long life and low maintenance costs. The hypoid first reduction is 30% stronger than spiral bevel, and works in series with the second reduction to take an equal share of the load. In the helical second reduction, strong helical gears with a wide range of ratios insure balanced double-reduction gearing.

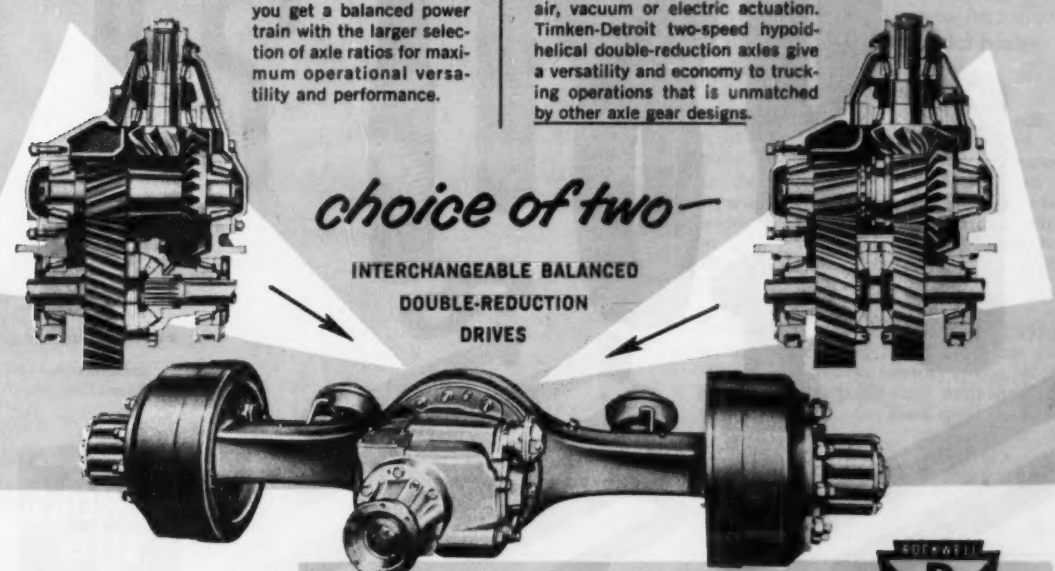


240 SERIES
SINGLE-SPEED, HYPOID-HELICAL DOUBLE-REDUCTION

Two full-sized gear sets form a balanced power train—with each gear set accomplishing a substantial reduction. This combination of husky hypoid first reduction gears coupled with rugged, wide-faced helical second reduction gears provides a double-reduction gear set that outperforms all others. Because the ratios of each reduction may be varied, you get a balanced power train with the larger selection of axle ratios for maximum operational versatility and performance.

340 SERIES
TWO-SPEED, HYPOID-HELICAL DOUBLE-REDUCTION

A true two-speed axle which provides two separate gear ratios through the use of two full-size helical gear sets . . . a "fast" ratio for maximum speeds and a "slow" ratio for greatest pulling power. Pick the most efficient gear ratio to meet your requirements of speed, load and road. Spring-flex power shifting provides simple, positive shifting with either air, vacuum or electric actuation. Timken-Detroit two-speed hypoid-helical double-reduction axles give a versatility and economy to trucking operations that is unmatched by other axle gear designs.



choice of two—

INTERCHANGEABLE BALANCED DOUBLE-REDUCTION DRIVES

Another Product of...

ROCKWELL-STANDARD CORPORATION

Transmission and Axle Division, Detroit 32, Michigan

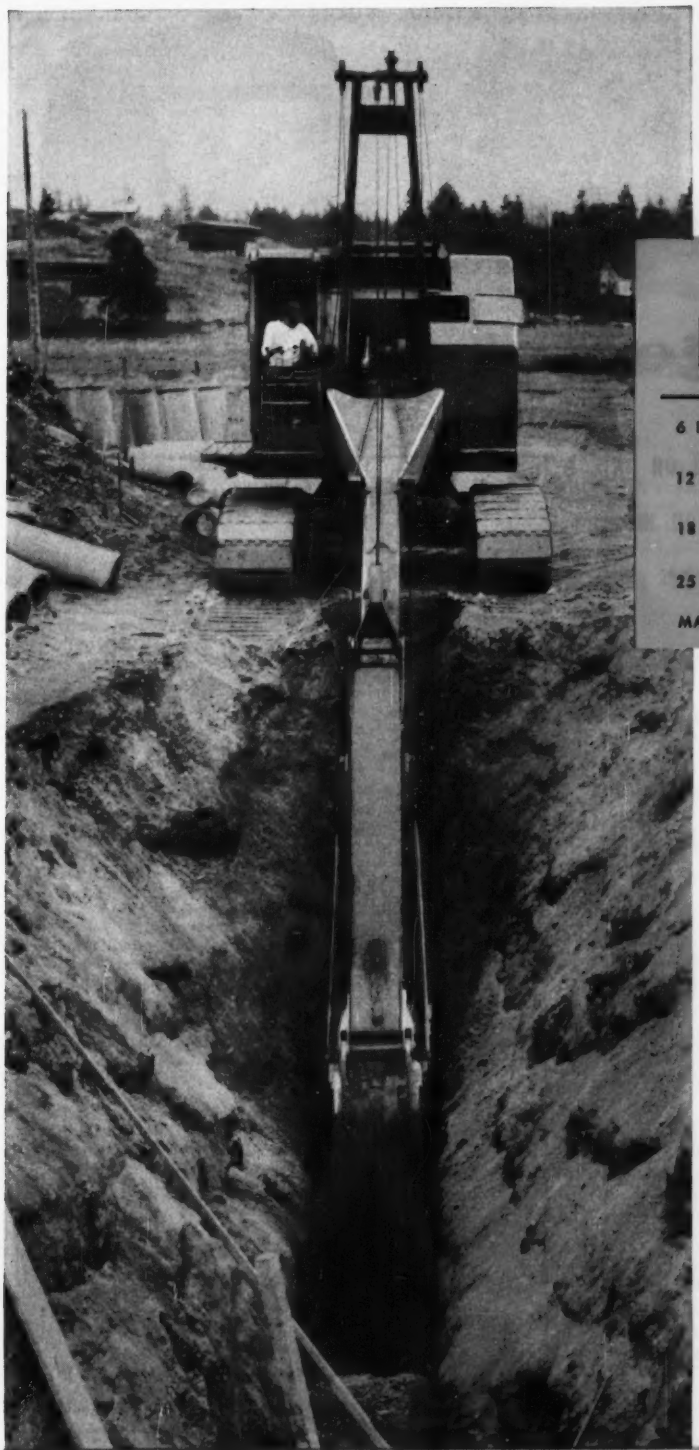
When you need construction fasteners fast, call Bethlehem. We carry a wide variety of standard types and sizes in stock. And when you need special fasteners, you can count on us for fast handling.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

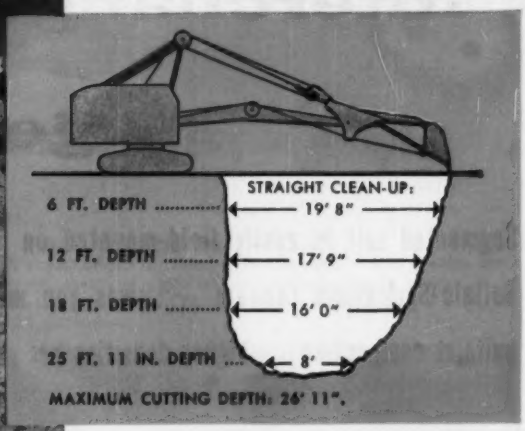
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



DIG MORE level FLOOR AT EVERY DEPTH



with Koehring 405 hoe

Ask any good hoe operator what it takes to get more feet of ditch per hour. He'll tell you it's the length of level-floor clean-up — at every digging depth, that counts! Any increase in level cutting action means fewer move-ups, more productive dig-hoist-swing-dump cycles, more feet of ditch per hour. That's why extra reach of Koehring® heavy-duty 405 hoe is so important to your job production schedules, and profits.

Consider this, too—long reach puts spoil bank well back beyond edge of cut—gives 13-foot clearance height at beginning of dump to load high-sided trucks. Big 1-yard dipper makes a wide cut—actual widths vary with job conditions and material to be dug. Variable settings of pitch braces allow quick adjustment of dipper angle to suit digging conditions.

Other capacities: 1-yard shovel; 1½-yard clamshell, dragline; 20-ton lift crane extend 405's extra work capacity over all jobs. Koehring distributor has complete details. Call him today. Or, send coupon for facts-by-mail.

SEND LITERATURE, SPEC. SHEETS ON 405 EQUIPPED AS:

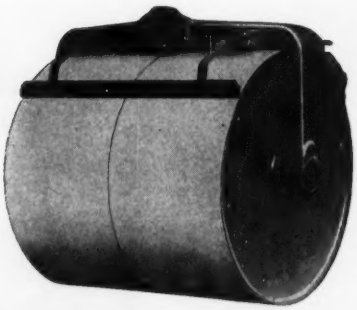
☐ HOE ☐ DRAGLINE
☐ SHOVEL ☐ CLAMSHELL
☐ LIFT CRANE

Mail to: **KOEHRING DIVISION, 3026 W. Concordia, Milwaukee 16, Wis.**

NAME _____ TITLE _____
COMPANY _____ DEPT. _____
STREET _____
CITY _____ STATE _____

CME K30

. . . Keep your eye on KOEHRING WORK CAPACITY



interchange this ...get 3 to 7% higher

Segmented roll is easily field-mounted on any Buffalo-Springfield tandem . . . gives you more uniform compaction . . . higher densities per pass

A quick-change of guide rolls and you combine the special advantages of a projecting-lug roll — plus those of a smooth-faced roll — all in a single pass! Result: Up to 7% higher compaction densities on stabilized base-materials, crushed or broken stone, hot and cold bituminous mixes, earth-fills.

IN OTHER WORDS . . .

For any Buffalo-Springfield tandem roller, new, or in the field, your small investment in segmented-roll attachment virtually gives you two machines in one. You convert to segmented guide-roll for faster higher-density compaction . . . switch back to smooth-faced roll as job requirements demand. You *tailor* your machine to the job . . . meet specs faster and more profitably.

If you're interested in this flexible approach to more profitable rolling, send coupon for new 6-page bulletin. It tells the full story!

BUFFALO-SPRINGFIELD COMPANY
SPRINGFIELD, OHIO
(Division of Koehring Company)

Send complete information on profit opportunities with segmented rolls.

NAME _____

TITLE _____

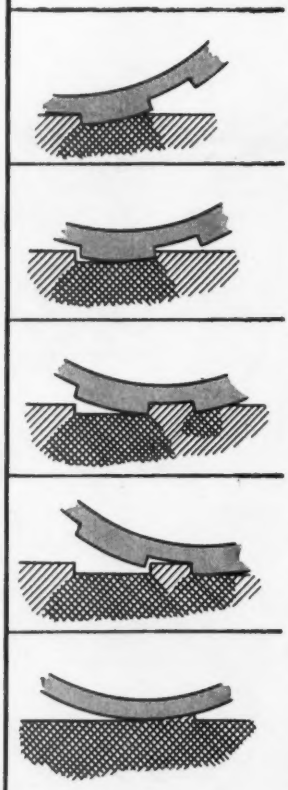
COMPANY _____

ADDRESS _____

CITY, STATE _____

B-1 CME

HOW SEGMENTED ROLL GIVES GREATER, MORE UNIFORM DENSITIES



Segmented pads enter vertically, with practically no lateral displacement of surface material. There's no build-up of material ahead of roll.

Spacing between staggered pads results in more compaction weight per unit of contact area. Compactive effort is from lower elevation up . . . results in more uniform top-to-bottom compaction.

Broad-faced special designed pads make clean exit . . . eliminate fluffing up of surface material, as occurs with lugs of sheepsfoot roller.

Because of bulb-shaped compactive effort, area below surface is knit tightly together in pattern of uniform density.

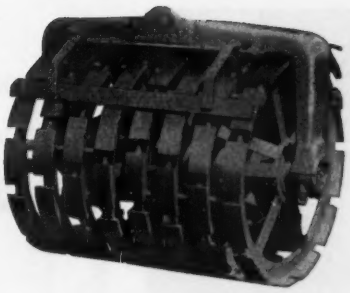
Follow-up action of smooth-faced drive roll easily takes care of shallow, web-shaped areas not compacted by segmented pads. (See photo next page.) End result: smooth surface, with uniform high-density compaction underneath.

The right roller for you

Portable tandems

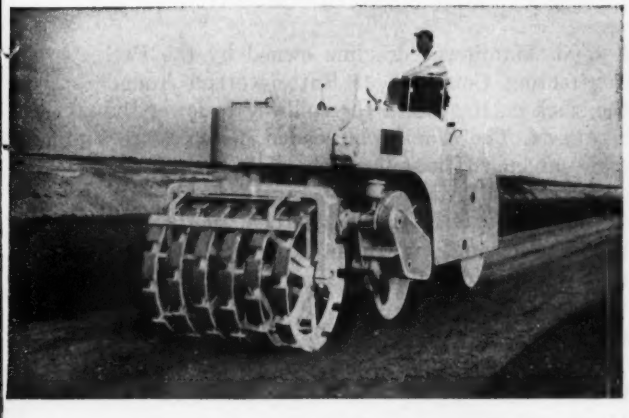
Two-axle tandems

with this



compaction densities

SEGMENTED ROLL is faced with staggered rows of heavy steel pads . . . applies pressure in footprint pattern. Roll is split in two free-rolling sections to minimize surface scuffing when making turns. To fit your needs for permanent or interchangeable use, they are available with or without separate axle and/or yoke.



TWO AXLE TANDEM with segmented roll works on airport project in Ohio. With one machine and one operator, this contractor combines advantages of both crawler-drawn sheepsfoot roller, and conventional tandem roller . . . all in a single pass.

THREE-WAY COMPACTION ON EVERY PASS is achieved here, compacting sub-base for airport runway in Columbus, Mississippi. Three-axle Buffalo-Springfield roller above uses segmented lead guide roll, vibratory center guide roll, followed by smooth-face drive roll.

3-wheel rollers | Pneumatic rollers | K-45 Kompactor | 3-axle tandems | 3-axle vibratory

BUFFALO-SPRINGFIELD COMPACTION EQUIPMENT • FLAHERTY SPREADERS AND SWEEPERS • STARDRILL-KEYSTONE DRILLING MACHINES

Manitowoc Model 4500 6-yd. dragline loads fifteen 27 ton trucks per hour on a "round-the-clock" schedule.

Flood threat created by earthquake is tamed with

MANITOWOC dragline

When the violent earthquake of last August hit near Ennis, Montana, the Madison River between Ennis and Hebgen dam was blocked by a 43 million cubic yard landslide. Plugged by tons of dirt and rocks, the river immediately backed up to form a lake over five miles long and up to 200 feet deep. Quake lake — as it is known by local residents — overflowed shortly after the earthquake, creating a dangerous flood threat to downstream communities.

At this point the U. S. Army Corps of Engineers bulldozed a 200 foot wide spillway along the length of the slide... a plan not entirely successful because of erosion at the lower end of the spillway.

A 6-yd. Manitowoc dragline owned by the F&S Contracting Company of Butte worked 'round the clock cutting down the spillway to lower the lake level. The Manitowoc loaded fifteen 27 ton trucks an hour. The spillway channel was deepened at the rate of .7 ft. each 12-hour shift. Early fears of flood danger were removed as the level of Quake lake was lowered by over 50 feet and shortened from seven miles to four.

Your Manitowoc distributor has full information on the Manitowoc dragline described here. Though your job problems may not be of earthquake size, he can analyze your operation and suggest the Manitowoc machine most profitable for you.

Manitowoc

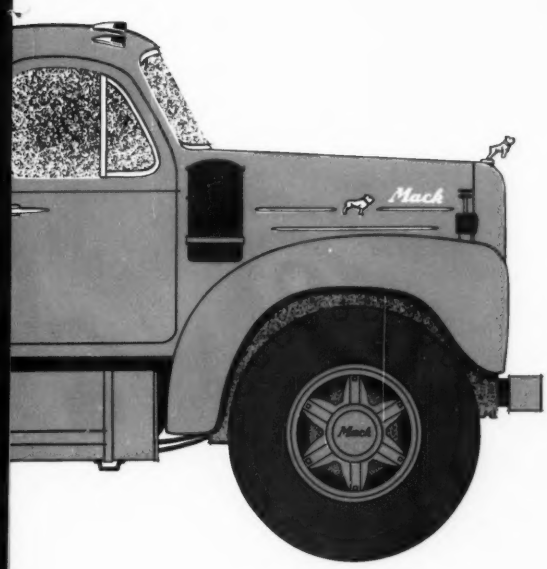
MANITOWOC ENGINEERING CORP.

(A Subsidiary of The Manitowoc Company, Inc.)

Manitowoc, Wisconsin

SHOVELS	CRANES	DRAGLINES	TRENCH HOES
1¼ — 6 YDS.	25 — 125 TONS	1¼ — 6 YDS.	1¼ — 3 YDS.

MACK BALANCED DESIGN



gives you more for each truck dollar

Mack Balanced Design is achieved by engineering and building components which work together with maximum efficiency. Only Mack can offer Balanced Design because only Mack makes all its own major components... makes them to standards of ruggedness and precision accomplished nowhere else. Mack Balanced Design results in a truck whose engine, clutch, transmission, axles and suspensions all work in harmony to produce an uncommonly smooth, powerful, responsive unit.

There's a MACK for

Mack B-40 Series—5 to 10 yards as rear dumpers, 5½ to 7 as mixers

They combine big-truck power, capacity and stamina with small-truck agility and economy for service as dumpers, tractors, mixers and platform trucks. 150 hp Mack Magnadyne gasoline engine. Wide choice of Mack transmissions up to 20-speed units, in on-highway and off-highway versions. Choice of heavy-duty axles and frames that offer standard and optional reinforcement. Option of power steering. Six-wheelers offer Mack Balanced Bogie with Power Divider. All-wheel-drive units as well

every construction job

Mack B-60 Series—6 to 12 yards as rear dumpers, 5½ to 8 as mixers

These trucks have hung up records for economy and long mileage life on every kind of job—as dumpers, mixers, tractors and platform trucks. The "workhorse of the industry," they're powered with Mack Thermodyne 185 hp gasoline engines, or Thermodyne diesel engines of 170 or 205 hp. Wide choice of Mack transmissions up to 20-speed units, in both on-highway and off-highway versions (depending on model). Choice of heavy-duty axles as well as frames that offer standard and optional reinforcement. Option of power steering. Six-wheelers feature exclusive Mack Balanced Bogie with Power Divider.

There's a MACK for

Mack B-80 Series—7 to 14 yards as rear dumpers, 7½ to 10 as mixers

Here's Mack profit-power personified! Big, rugged B-80's can be custom-assembled to meet your needs exactly: as tractors for heavy-duty hauling of platform or dump trailers . . . or as truck chassis for dumper, mixer or utility service. Wide option of power and gear ratios. Available in 4- and 6-wheel models including six-wheel-drive units. Powerful, durable braking power.

Up to 222 hp Mack gasoline or 205 hp Mack Thermodyne diesel engines; up to 335 hp stock diesels. Choice of Mack transmissions including Mack 20-speed Quadruplex. Mack Dual Reduction rear axles and—on 6 wheelers—Mack Balanced Bogie with Power Divider. Power steering standard on Mack front-wheel-drive models. Optional on others.

Mack "L" Series—15-40 ton end-dumpers to 50-ton bottom dumper

The Macks in the "L" Series—LRX, LVX, LYSW, and the giant LRVXT tractor which pulls 50-ton bottom dumper—are designed with the power and strength to handle the biggest construction jobs. They shrug off the relentless pounding of big-yardage shovels, and are loaded with features for top performance, long life and freedom from downtime.

Rugged power trains offer up to 450 hp diesel engines . . . Mack overgeared transmissions or torque converters and Mack Planidrive rear axles . . . powerful air brakes of latest design handle steepest descents . . . maneuverability characteristics of smaller vehicles—thanks to ideal power steering and air-assisted clutch.

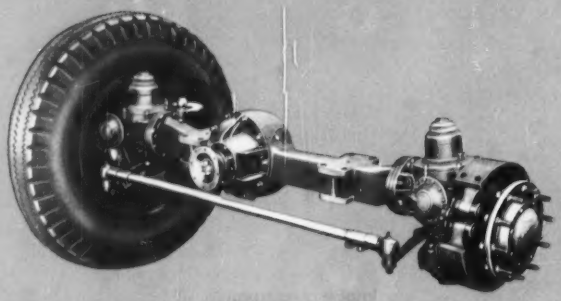
For end-dumper capacities up to 40 tons, where maximum flotation is required, a full line of tandem rear axle Macks is available.

MACK BALANCED DESIGN

MACK
for over 6 straight years
NO. 1
by far in sales of diesel trucks

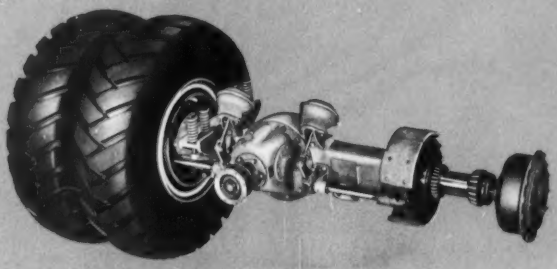
means components integrated for longest prime of life.

Only Mack offers these exclusive quality components:



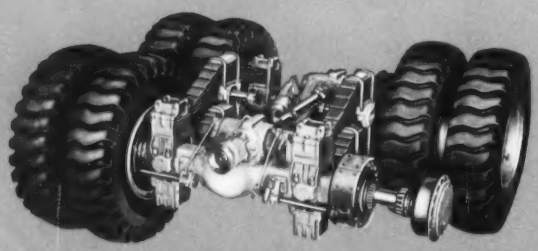
Strong Mack-built axles

Mack's drop-forged I-beam front axles are made super strong for long, trouble-free service. Extensive use of heat-treated steels for crucial parts means minimum maintenance. And Mack's exclusive **front-drive axle** (shown above) for all-wheel-drive trucks offers the greatest ground clearance and strength of any made—with all parts fully enclosed.



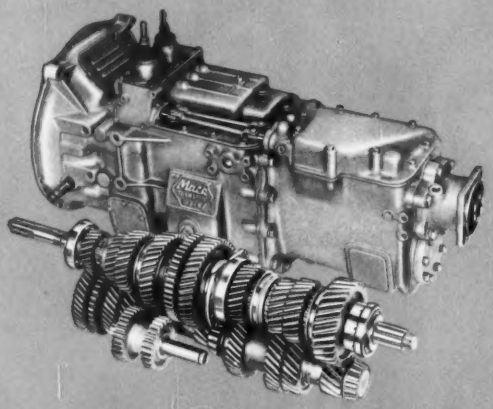
Durable Mack-built 2-wheel rear axles

Mack's two-wheel, rear-axle assemblies have an unmatched reputation for service under strenuous conditions. Dual Reduction carrier and Mack's famous Planidrive gear reduction at the wheel hubs provide the smooth distribution of power vital to top truck performance.



High-traction Mack-built Balanced Bogies

Macks perform where other trucks bog down—in mud, loose gravel or sand—thanks to Mack's exclusive Balanced Bogie with Power Divider—a 4-wheel drive, tandem rear-axle assembly with an inter-axle differential that distributes the power to wheels with greater traction. To achieve maximum road clearance in larger units, Mack Planidrive final reduction gears in all 4 hubs eliminate the need for outsized carriers and low-slung differentials.



Long-lived Mack-built transmissions

Service records prove that Mack transmissions—like this 20-speed Quadruplex—stand up to heavy-duty hauling far longer and need less attention than any others—thanks to the use of the finest gear metals known...to painstaking precision manufacture...and to exclusive Tetrapoid gear design that gives maximum strength, longer life and smoother action. Five- to twenty-speed units, each with ideal ratio steps.

MACK FIRST NAME FOR TRUCKS

Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ontario

Printed in U.S.A.

When this photograph was taken, 8,000 yards of right-of-way had been cleared of trees, and the roadbed was being prepared for surfacing.

"Sinclair Helped Cut Maintenance Costs On Every Mile of Our Northway Section"

says J. Hanna, Superintendent,
D. A. Collins Construction Company

The Northway, another link in the nation's grid of superhighways, connects the New York State Thruway with the Canadian border. Mr. Hanna says, "Our heavy-duty equipment took the toughest kind of punishment on this project. Work ranged from ripping out trees to building bridges. Yet our maintenance costs were far below what we anticipated. Much of the credit must go to Sinclair's service and their high quality fuels and lubricants. They kept our equipment operating at peak efficiency . . . *on schedule.* These are reasons enough why we use Sinclair Products exclusively."

If you haven't discovered the cost-cutting possibilities of Sinclair services and products, see your local Sinclair Supplier – or write Sinclair Refining Company, Contractor Sales Dept., 600 Fifth Avenue, New York 20, N. Y.

Sinclair
Fuels and Lubricants

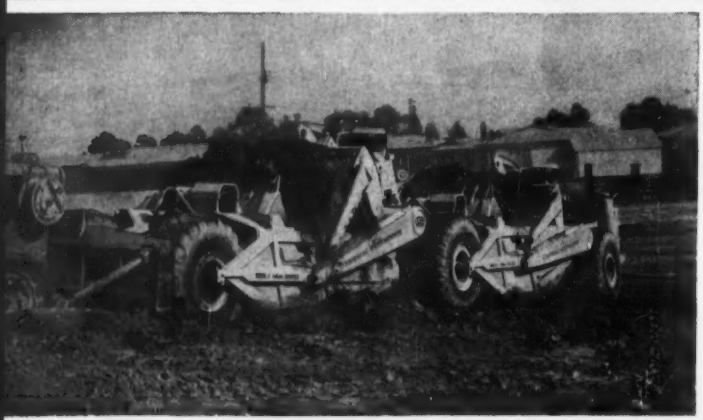
Sinclair

Mr. Hanna reports, "The portable trailer tanks Sinclair loaned to us contributed greatly to the speed and efficiency on our section. We were able to refuel on the job . . . **fast,** and keep our equipment working **full time.**"

NOW haul two loads ...with LW

Here's the best way ever developed to cut earthmoving costs: LW TANDEMS. *You can now pull and operate TWO scrapers behind any electric-control 'Pull* prime-mover.* You get 100% more capacity at only about 30% more cost!

The tandem concept is not new: experiments toward this earthmoving ideal have been underway for decades. Only now, however, *and only from LW,* has a practical tandem, in a practical size-range, been available.

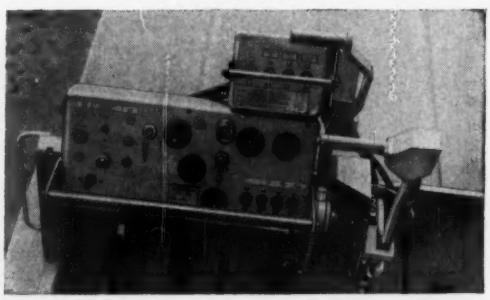


"C" Tandem loads 36 yd in 40 to 55 seconds

At Pinole, California, Contractor Al Periera used this 270-hp C Tournapull® with tandem C Fullpak® scrapers to move *36 yards per cycle.* In pre-ripped clay, with a 191-hp pusher, C Tandem needed only 40 to 55 seconds to load both bowls heaping full. Tandem kept pace with single scraper on same job, climbed 18% grades, used only 13 more gallons of fuel per shift.

Electric control solves problem of operating second scraper

Main reason ONLY LW offers tandem scrapers is LW electric control. These buttons operate bowl-lifts, aprons, and tailgates . . . top row for rear scraper, bottom row for front. Moving a button closes circuit, sends power from engine mounted generator, along wires to desired control motor. Unlike mechanical or hydraulic power, electricity arrives instantaneously, with no loss of power, and with no extra power source needed.



LW Distributors everywhere can now convert your present 'Pulls to tandem operation, or equip you with <u>new</u> 1960 'Pulls already prepared for tandem use. <u>See *your*</u> LW Distributor soon, for full details!

every trip TANDEMS

Making the breakthrough possible is exclusive LW electric control. This system sends working-power any distance via simple wire, thus solving the problem of operating a second scraper as efficiently as the first. And LW has developed a universal-swivel hitch that permits complete maneuverability and handling ease of the tandem.

YOU SAVE THREE WAYS:

1 — Original investment:

You double your capacity, but pay only for a second scraper and incidental hitch and installation. You *save* the price of the second prime-mover!

2 — Operating costs:

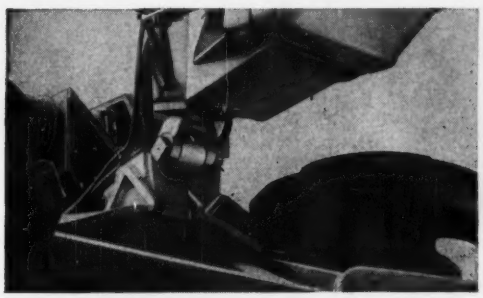
One operator handles both scrapers. Your only "extra" operating cost is for a few more gallons of fuel per shift!

3 — Maintenance:

Upkeep is *almost the same* for "singles" as for tandems! You have 2 more tires to maintain, plus nominal maintenance of the second scraper, but there is no extra engine, no extra transmission or final drive to care for!

Big, rugged hitch permits full maneuverability

Universal swivel-hitch joining front and rear scrapers lets tandem U-turn, back-up, perform any other maneuver possible with single scrapers, with no jack-knifing. Hitch base is welded to reinforced push-block frame of front scraper. Rear scraper's electric leads "plug in" to jacks on front scraper. Hook-up is so simple that once installed, you can change from single to tandem operation, or back, in less than half an hour.



YOU ENJOY THESE ADVANTAGES:

1 — You need less pusher-power:

Only one of the tandem scrapers loads at a time, so you don't need "super" pushers or tandem-pushers. You save pusher positioning time, too.

2 — Haul roads take less abuse:

Ton-for-ton, tandems punish haul roads less than single scrapers of equal capacity. And there's less congestion and delay with fewer units.

3 — You get more adaptability:

You can meet changing job conditions by hitching or unhitching the "extra" scraper on short notice. And you can still interchange your basic scraper for a 'Pull Rear-Dump, whenever needed.

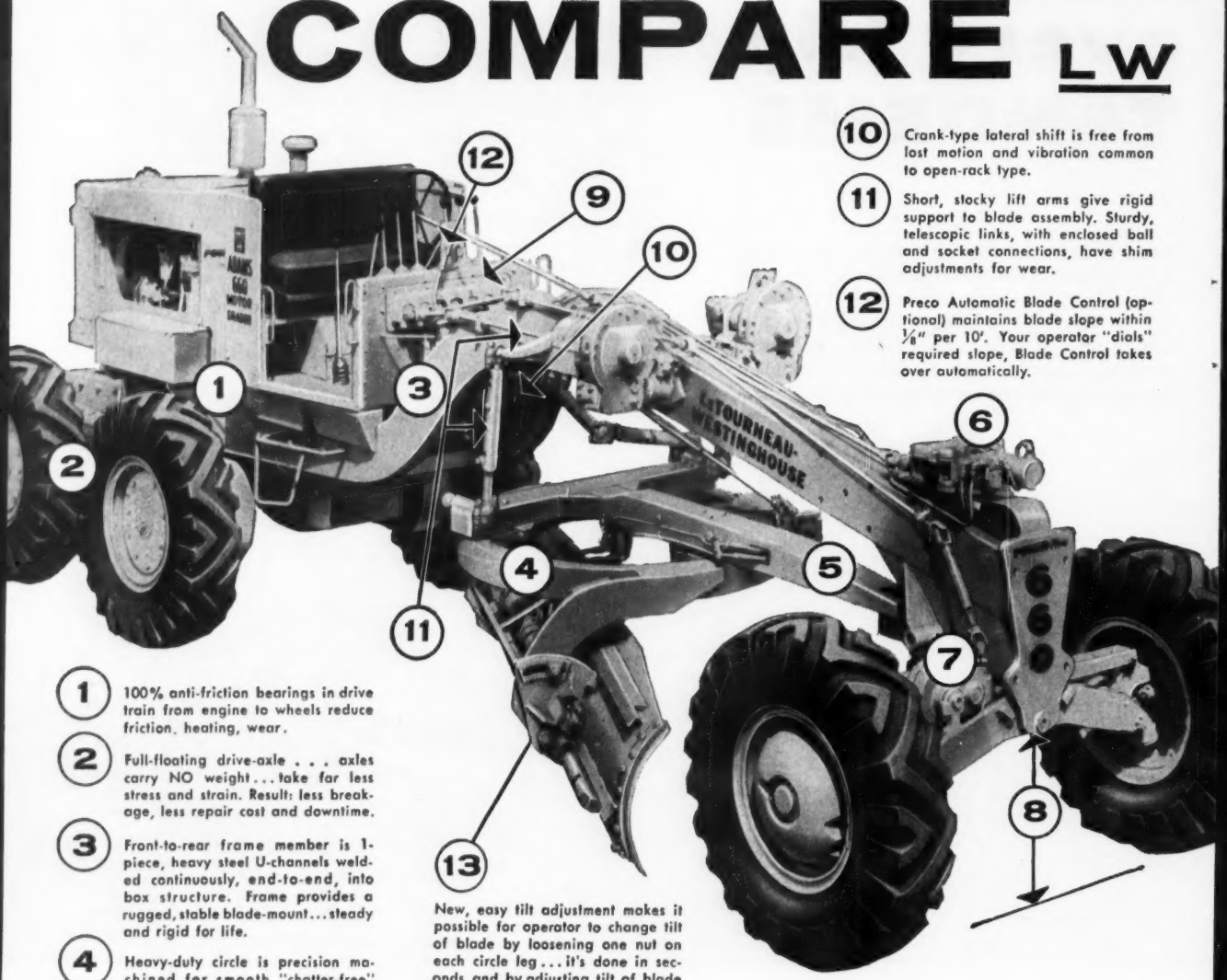
*Trademark TP-2256-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

COMPARE LW



10 Crank-type lateral shift is free from lost motion and vibration common to open-rack type.

11 Short, stocky lift arms give rigid support to blade assembly. Sturdy, telescopic links, with enclosed ball and socket connections, have shim adjustments for wear.

12 Preco Automatic Blade Control (optional) maintains blade slope within ⅛" per 10'. Your operator "dials" required slope, Blade Control takes over automatically.

1 100% anti-friction bearings in drive train from engine to wheels reduce friction, heating, wear.

2 Full-floating drive-axle . . . axles carry NO weight . . . take far less stress and strain. Result: less breakage, less repair cost and downtime.

3 Front-to-rear frame member is 1-piece, heavy steel U-channels welded continuously, end-to-end, into box structure. Frame provides a rugged, stable blade-mount . . . steady and rigid for life.

4 Heavy-duty circle is precision machined for smooth "chatter-free" operation. The *big* 63"-diameter circle assures accurate control of cut.

5 Strong T-shaped drawbar gives firm circle support . . . for accurate blading in all positions.

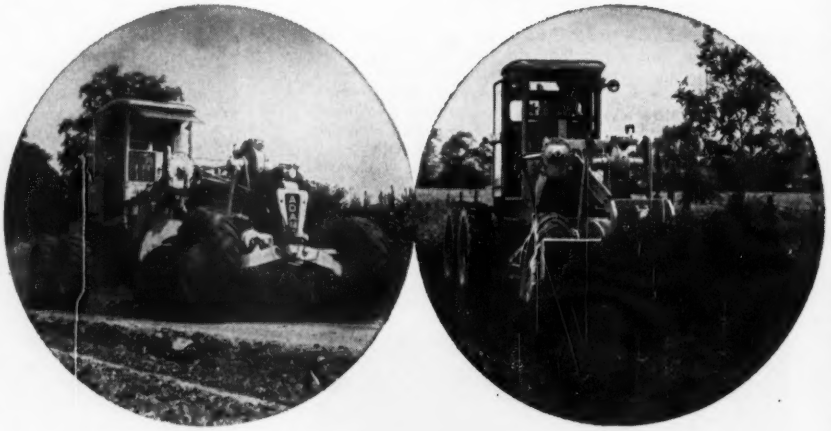
6 With power steering, operator exerts only slight pressure on steering wheel, and hydraulic power does the work. Yet, "road feel" is retained. Power-steering system has its own hydraulic pump.

7 Gear-driven leaning-wheel mechanism is enclosed to give protection against dirt. Wheels hold set position . . . require no safety lock-pin for high-travel-speeds, or when using front-end attachments.

8 You have up to 28" front-axle clearance, depending on tire size. This prevents axle from bulldozing high windrows, lets grader come up out of deep ditch-cuts without front-axle dragging the shoulders.

9 Blade controls operate through three-jaw clutches that mate without shock or kick-back. Joint-free construction of power box eliminates oil leakage on cab floor.

13 New, easy tilt adjustment makes it possible for operator to change tilt of blade by loosening one nut on each circle leg . . . it's done in seconds, and by adjusting tilt of blade for light or heavy grading, operator does more and better work.



Efficient LW grader attachments include: Ateco ripper, scarifier, bulldozer, push-plate, Jebco Elegrader and Jebloader, V-type snow plow, and standard or rotary-type snow wing.

advantages with any other grader

...you'll be convinced they give you more for your money!

Best way to judge a grader is to compare it... against any machine in its class. Do this with LeTourneau-Westinghouse graders; you'll find they give you *more money-saving, more profit-boosting features than any other grader on the market.* Others may offer *some* of these advantages, but you get all of them in LW graders.

Compare transmissions:

Other graders offer transmissions with 6 to 10 speeds; LW graders have 15... 8 forward, 4 reverse, and 3 optional creepers. With *more* full-power gear-ratios you can handle most grading jobs at higher speed. Result: you can do up to 28% more blade work. LW's faster *back-up* speeds save time on shuttle-type work. In addition, you save time getting to and from a job, because top *travel* speeds on LW graders are up to 5 mph faster than on most other graders. On LW POWER-*Flow*® models you get *infinite* speed ranges, with torque-converter transmissions *automatically* matching speed and power to any load.

Compare engines:

You choose from either General Motors or Cummins power plants for your LW graders, to standardize your fleet, lower your parts inventory and service costs. No matter which engine you choose, it is *mounted on rubber,* to reduce vibration, increase operator comfort.

Compare construction:

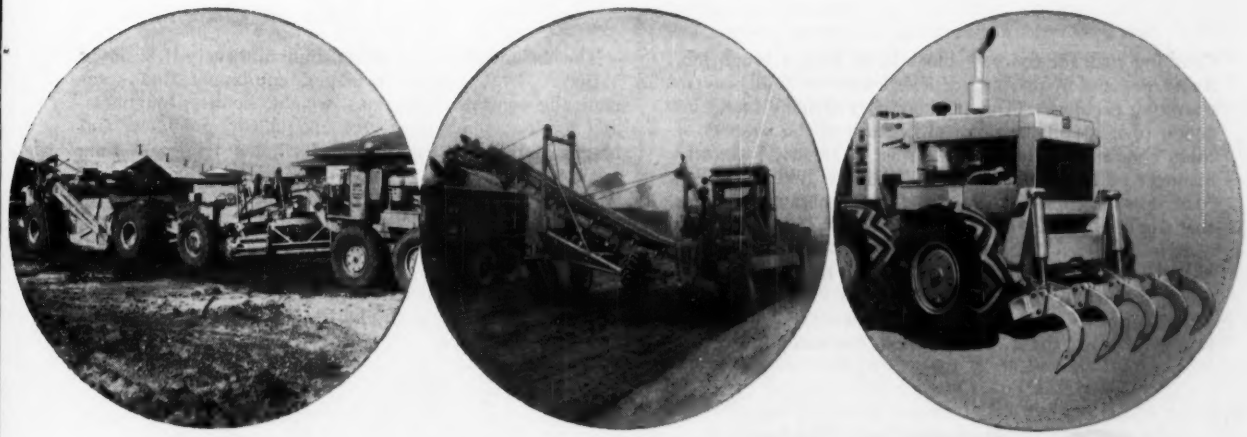
LW's one-piece box frame is *continuous welded, end to end.* LW rear axles *carry no weight;* they "float" on anti-friction bearings to transfer *full* power to drive-wheels. High-arch, front axle is *welded bar-and-plate* for long life. ALL gears and shafts run on anti-friction bearings. And the big 63" blade-circle is precision-machined... top, bottom, and inside. Compare *these* strength features to those of ANY other grader.

Compare operation:

LW controls are grouped for "natural" hand-motions to get fastest blade positioning. All average blade positions can be obtained from the cab. Blade movement is *fast*... you can switch from high bank-cut to deep ditch-cut in less than a minute! Positive-acting hydraulic brakes operate at light touch of convenient pedal. What's more, on LW graders, your operator has clear view ahead, *and* can see both ends of the blade... where visibility is most important. He has this visibility *whether he's sitting or standing!*

Check the features illustrated here, then take the next step... ask us to *show* you an LW grader in the size you need. Seven models from 67 hp to 190 hp. We'll arrange for a demonstration at your convenience... with your operator at the controls. A phone call or a short note is all it takes!

*Trademark G-2106-G-2



LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

U. S. ROYAL V-BELTS from the Power Unlimited complete belt line

Concrete evidence...

balanced driving power pays off

Crushing rock for concrete block is, at best, a tough job. Stone dust and flying rock particles create unusually severe operating problems. (Our photographer actually found in-action photographs impractical because of the severity of these conditions.) Says Mr. Charles P. Lower, Jr., works manager of Bethayres Concrete Products, Bethayres, Pa., "The crusher is probably one of the toughest applications that can be found for any belt."

It is estimated that each of the six C-105 U. S. Royal V-Belts on the motor-to-crankshaft drive travels a distance of approximately 120,000 miles a year. Yet despite the severe abrasive atmosphere and the "occasional jamming" that takes place, these "U. S." V-Belts last *many years.*

The "balanced driving power" built into every U.S. Royal V-Belt . . . by specially developed equipment that automatically controls dimensions, weight, density, toughness, and tension members to give unequaled smoothness and length stability . . . has proved its value time and time again under every conceivable operating condition.

SEE HOW BALANCED DRIVING POWER CAN BENEFIT YOU BY CONTACTING YOUR "U. S." POWER TRANSMISSION DISTRIBUTOR FOR THE STOCKS AND SERVICE YOU NEED.

U. S. Royal V-Belts and engineering assistance for these drives supplied by "U. S." Distributor Lindsay-Oberholzer of Philadelphia, Pa.

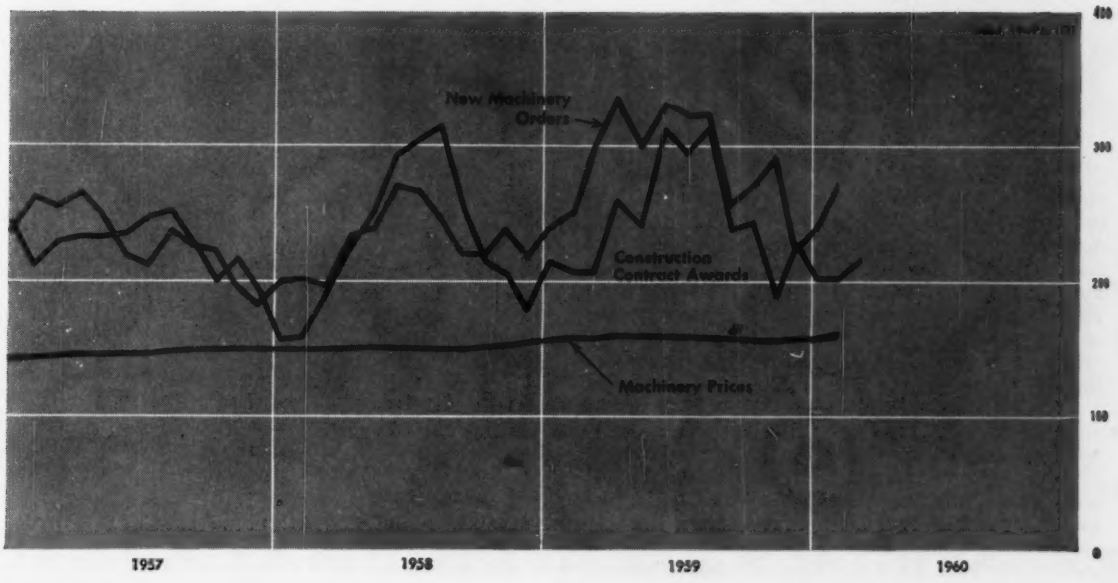
Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Trends in the Machinery Market



Price Index

	JANUARY 1960	MONTH AGO	YEAR AGO	% CHANGE 1959-1960
All Types of Equipment	173.6	172.9	170.9	+ 1.6
Cranes; Draglines, Shovels	**171.2**	**170.5**	**168.3**	**+ 1.7**
Shovel, ½ cu yd	165.0	165.0	156.2	+ 5.6
Shovel, ¾ cu yd	173.9	173.9	173.3	+ 0.3
Shovel, 1-1½ cu yd	187.0	184.3	183.7	+ 1.8
Shovel, 2-2½ cu yd	164.7	164.7	158.8	+ 3.7
Shovel, 3-3½ cu yd	167.8	167.8	165.2	+ 1.6
Shovel, 6 cu yd	195.0	195.0	184.1	+ 5.9
Crane, truck mounted	168.2	166.2	168.8	— 0.4
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	157.5	157.5	157.5	0
Bucket, dragline	169.3	169.3	189.7	—10.8
Scrapers and Graders	**165.8**	**165.8***	**153.8**	**+ 1.2**
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	156.8	156.8	156.8	0
Scraper, 2 Wheel, 15-19.5 cu yd (a)	124.9	124.9	123.7	+ 0.9
Grader, heavy duty	172.6	172.6	171.1	+ 0.9
Grader, light & medium	171.1	171.1	166.1	+ 3.0
Tractors (non-farm, incl industrial)	**189.9**	**188.7**	**187.0**	**+ 1.6**
Wheel type, off-highway (a)	129.0	129.0	128.2	+ 0.6
Crawler type, 50-74 dhp	195.8	193.6	191.9	+ 2.0
75-99 dhp	200.0	197.2	196.4	+ 1.8
100-154 dhp	192.4	192.4	191.3	+ 0.6
155-200 dhp	203.3	201.3	201.3	0.9
Machinery, Tractor Mounted	**169.0**	**169.0**	**168.4**	**+ 0.4**
Dozer, cable controlled	154.4	154.4	154.4	0
Dozer, hydraulic controlled	186.6	186.6	186.6	0
Cable power control unit	151.4	151.4	151.4	0
Loader, tractor shovel	162.5	162.5	161.0	+ 0.9
Specialized Machinery	**156.2**	**156.2**	**153.2**	**+ 2.0**
Ditcher	150.1	150.1	156.6	— 4.2
Roller, tandem	220.2	220.2	198.6	+10.9
Roller, 3 wheel	174.9	174.9	170.2	+ 2.8
Ripper and rooter	150.5	150.5	150.5	0
Dewatering pump, 10 M gph	110.3	110.3	112.0	— 2.5
Dewatering pump, 90 M gph	151.0	151.0	145.7	+ 3.6
Portable Air Compressors	**167.5**	**167.5**	**159.5**	**+ 5.0**
Contractor's Air Tools	**181.6**	**181.6**	**181.6**	**+ 3.2**
Mixers, Pavers, Spreaders	**158.2**	**157.5***	**151.4**	**+ 2.7**
Mixer, portable, 11 cu ft	166.8	166.8	163.2	+ 1.6
Mixer, portable, 16 cu ft	172.7	172.7	166.5	+ 2.4
Mixer, truck, 6 cu yd	132.7	132.7	129.1	0
Mixer, paving, 34 cu ft	193.5	193.5	189.2	+ 2.3
Concrete finisher & spreader	196.7	196.7	183.5	+ 7.2
Bituminous distributor	126.2	122.3	122.3	+ 3.2
Bituminous spreader	170.2	170.2	170.2	0
Bituminous paver	163.2	163.2	155.8	+ 4.7
Off-Highway Trucks, Wagons (b)	**101.1**	**101.1**	**100.6**	**0**
Contractors off-highway truck (b)	101.1	101.1	100.6	0
Trailer dump wagon (b)	101.4	101.4	101.4	0

• (a) January 1955=100 • (b) January, 1958=100 *Revised
BLS Primary Market Price Indexes, U. S. Department of Labor, 1947-49=100

Equipment Prices May Rise This Month

Price tags may be marked up on several types of construction equipment this month.

Though the equipment price front was pretty static during the first six weeks of this year, the picture changed in February. Thew Shovel marked prices higher on nearly its whole line of construction equipment on February 19. Increases were 3% on truck cranes, 2% to 3% on crawler cranes and shovels. J. I. Case announced price increases effective March 1 ranging from 2% to 3% on its crawler tractors and tractor shovels.

Some other manufacturers may follow suit. A major Chicago distributor tells *Construction Methods* that he got word from five major manufacturers and seven companies making smaller items that they would post higher prices this month.

A number of equipment makers have been cautious about making price changes this year until they can see how the orders trend is shaping up and estimate what effect price increases will have on sales.

Their caution is more clearly revealed in the less bullish sales forecasts a sample of the industry reported to the McGraw-Hill Economics Department in February. These manufacturers now estimate their 1960 new orders volume will rise 7% above last year compared to the 14% gain they forecast last October for the first nine months of 1960.

Based on these forecasts of individual firms, the McGraw-Hill Economics Department forecasts its New Orders Index for Construction and Mining Equipment by quarters this year will be: first quarter 305 (up 20% from the last quarter of 1959); second quarter 333 (record high); third quarter 312; and fourth quarter 308. The index is based on 1949 average monthly order volume as 100.

Big Year for Missile Base Work

CONSTRUCTION of launching bases for intercontinental ballistic missiles is now a full-fledged major market for contractors. Last year, this new market provided contractors with contracts valued at $355 million, reported by *Construction Methods*. This year's contract total will be even bigger:

- Three major projects have already been let at a total contract value of about $70 million.
- Six more underground Atlas missile launching bases should be awarded by July. Estimated costs range from $44 million to $47 million for each base.
- Four more underground Titan missile bases, estimated at $42 to $49 million each, are going to come up for award after July 1 as part of the fiscal 1961 missile construction contracting schedule. (And another four are included in the plans for fiscal 1962 which starts July 1, 1961).

But the missile base construction boom won't stop with the last of the Atlas or Titan bases. The solid-fueled Minuteman missile, now in development, will need additional bases. These Minuteman bases will probably start coming up for bids after January 1, 1961. They'll be simpler than the launching bases for the liquid-fuel Atlas and Titan because they won't entail the complicated and costly propellant fueling systems. In fact, the Minuteman launching silo will be little more than a concrete firing tube with the missile standing on a 6-ft-high stand. Because they'll also be "hardened" (underground) each contract will cost several millions—but much less than the Atlas or Titan bases which range from $22 million for a base with three launching clusters (3 launchers per cluster) to $44 million or more for nine 1-launcher sites.

Missile construction is tough to bid and tough to construct because it's complicated, construction schedules are very tight (13-15 months), and technical changes in the missiles themselves bring about many change orders making it more difficult for contractors to keep on schedule. Though the Pentagon has delayed some completion dates, it is evidently satisfied with contractors' progress on jobs under way.

A mile-wide spread between bids last month for construction and installing liquid propellant loading systems at seven Atlas missile launching sites illustrate contractors' problems in figuring complicated missile base construction.

The five bids received last month for the contract to build these systems at seven Air Force bases ranged from the apparent low of $10.9 million submitted by Paul Hardeman, Inc., Stanton, Calif., to a high of $25.8 million by A. O. Smith Corp., Milwaukee, Wis. The apparent low bid was about one-half the engineering estimate of $20.4 million.

Coming Up for Bids

Contracts for constructing two more Atlas missile launching bases should be awarded by the end of this month at Lincoln AFB, Neb., and Schilling AFB, Kan. Lincoln AFB facilities will be entirely hardened, but only the missile storage facility will be hardened at Schilling AFB where the missile will be launched after it's raised to the surface.

The Fort Worth District Corps of Engineers expects to ask for bids in May on hardened Atlas missile launching sites at points surrounding Dyess AFB, Abilene, Tex. Estimated cost is $44-$47 million.

Upcoming Contracts

Contracts for three more Atlas missile bases should be awarded by July at these locations: Nine hardened launching sites at Altus AFB, Okla. (Tulsa Dist. Corps of Engineers), estimated to cost $46.9 million; and hardened launching sites at Walker AFB, N. M. (Albuquerque Dist. Engineers) and nine sites at Plattsburgh AFB, N. Y. (New York Dist. Engineers), both estimated at $44 million.

Low Bids Go Lower

"Bidding is getting so low that I'm scared to guess what will come next," says M. W. Parse, assistant chief of the engineering division of the Tulsa District, Corps of Engineers. His comments followed the bid opening for an 8.8-mi relocation of U.S. 69 and the "Katy" Railroad across Eufaula Reservoir. Apparent low bidder at $6.7 million was H. B. Zachary Co., San Antonio, 9% under the engineers' estimate of $7.4 million.

That's not too great a margin in today's heavy construction market—probably the most competitive of the postwar period. But the $6.7-million bid is less than one-half of the original engineering estimate of about $15 million, and it's far below a later revision down to $12.8 million. The $7.4-million estimate was made in January after the project was advertised.

For engineers, chasing contractor prices down is a relatively new procedure. During the 1950's engineering estimates were generally increased from time to time as a project passed through the planning stage to reflect the rise in costs and higher contractor selling prices. From 1951 to 1953, Parse recalls, "contractors kept bidding over our estimates, and we couldn't keep up with them."

But now bidding is "fierce," and there's more competition for new heavy construction jobs. In fact, Parse hasn't seen anything like it in his long experience.

That this is no isolated situation is apparent from stiffening competition among highway and bridge contractors in several states and in other types of heavy construction.

Contractor bid prices on federal-aid highways let in the fourth

continued on page 51

Brinson-Allen's No. 14 is equipped with Preco Automatic Blade Control. This exclusive factory-installed attachment for all Caterpillar Motor Graders saves money on a wide range of applications. With the desired slope set on the dial, the operator only has to control depth of cut. The transistorized unit automatically maintains blade slope within ⅛ inch in ten feet.

CAT NO. 14 MOTOR GRADER INCREASES PRODUCTION 20 PER CENT

This Cat No. 14 Motor Grader handles subgrade and base on the western approach of the Interstate System highway bridge between Tampa and St. Petersburg, Fla. Charlie Clyatt, superintendent on the job for owner Brinson-Allen of Tampa, reports, "We have increased production about 20 per cent. The No. 14 has more weight, traction and power, gets the job done quicker. It has never failed to stay well ahead of the base crew."

Here's why the big No. 14 excels in weight, power and traction: It weighs a hefty 29,280 lb. . . . the 150 HP turbocharged engine delivers power to spare . . . 14:00-24 tubeless tires all around provide excellent stability. The 12 ft. (standard) or 14 ft. (optional) moldboards with ample throat clearance between moldboard and circle assure you of greater loads than ever before.

But this versatile motor grader has more than sheer power and weight. Features like the dry-type air cleaner which removes 99.8 per cent of the dirt from intake air means longer service life. The exclusive Caterpillar oil clutch, which operates up to 2000 hours without adjustment, practically eliminates down time for clutch repair. Operator has excellent visibility to front wheels, toe of blade and circle. The power steering and power brakes are designed for operator efficiency and high productivity. These are just a few of the reasons why the No. 14 is the most profitable and productive motor grader in its class.

Heavy-duty circle and moldboard on the No. 14 provide big load carrying capacity. Circle and moldboard are strong to match engine power and can absorb the punishment of rough work. Mechanical blade controls provide precise, fast blade adjustment and positive hold.

See your Caterpillar Dealer and ask him to demonstrate the No. 14 on the toughest application *you* can find. See for yourself how the rugged No. 14 can handle the hard work.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

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STEP UP PRODUCTION WITH THE NEW NO. 14

More proof that...

AMSCO HELPS YOU MOVE MORE TONS PER DOLLAR

How AMSCO screen parts and Simplex 2-Part Dipper Teeth are giving users greatly improved service life*

AT A LARGE NEW ENGLAND QUARRY

AMSCO CHUTE PLATES LAST 5 YEARS VS. 4 WEEKS FOR PREVIOUS TYPE

In the screen house of this quarry, two Amsco HC-250 abrasion-resistant chute plates are used on each Hi-G discharge screen. 500 tons per hour pass over each plate, during the two-shift, 20-hour operating day.

This installation resulted from a previous test, in which a set of Amsco plates was compared with regular carbon steel plates. The Amsco Chute Plates *lasted about 5 years,* whereas the competitive plates had to be replaced every 4 weeks.

The quarry operator reports that the Amsco plates presently installed are holding up excellently in service. Their exceptionally long life and trouble-free service means big dollar savings—through elimination of costly shutdown time.

ON THE NIAGARA POWER PROJECT

AMSCO SIMPLEX 2-PART TEETH DIG 40,000 YARDS OF ROCK BEFORE REPLACEMENT

At the right, you see the type of rugged rock excavation in which this outstanding service record was set. It's part of the Niagara Power Project—Conduit #2 South—being handled by Gull & Defelice Construction Company.

All dippers on the job are equipped with Amsco Simplex 2-Part Reversible Teeth. They operate 16 hours a day, 6 days a week—*handle approximately 40,000 yards of rock*—before tooth replacement is required.

In addition to their exceptionally long wear, the fact that Simplex Teeth *can be replaced in ten minutes with no trouble* is an important advantage to the operators. It all adds up to big savings—in replacement cost and shovel downtime.

*Patent No. 2,904,908

Wherever high impact and abrasion are problems, you'll "move more tons per dollar" with Amsco Dippers, Dipper Teeth and Crusher Parts. See your equipment dealer, or write us direct for technical bulletins.

AMSCO

AMERICAN Brake Shoe COMPANY

American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions
Welding products distributed by Canadian Liquid Air Co., Ltd.

Left: Close-up of Amsco Chute Plates used on each discharge Hi-G screen.

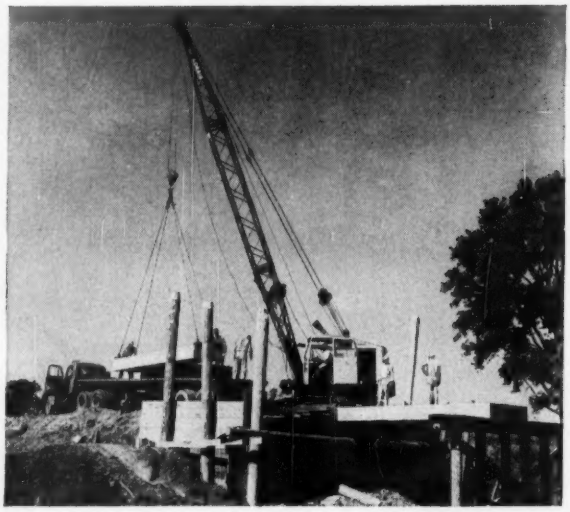
Right: General view of Hi-G screen in screen house of large New England quarry.

Left: General view of excavation at Conduit #2 South. Dipper on Bucyrus Erie 88B shovel is equipped with Amsco 2-Part Reversible Teeth.

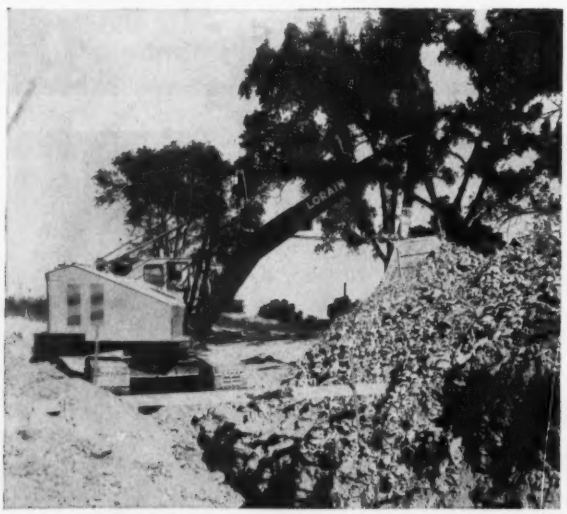
Right: Close-up of Amsco 2-Part Reversible Teeth, showing special pin lock which assures positive locking of the reversible tip.

HEAVY DUTY ¾-YARD SHOVEL is fast, rugged, a real profit-maker. Two-lever, "Joy-Stick" controls are available to speed operations. Choice of three crawlers. Boom is all welded with cable crowd, power dipper trip.

VERSATILE 18-TON CRANE with simple, precision controls. Exclusive square-tubular-chord boom boosts payloads. Simultaneous swing, hoist and travel available. Crane converts to dragline, clamshell, shovel or hoe.



LORAIN 26: FAST WAY TO MAKE A FAST BUCK



HARD DIGGING HOE has the weight for forceful "crowding" . . . the stability and power to work toughest materials. Long, gooseneck boom permits maximum digging ranges. All control linkage on anti-friction bearings.

DRAGLINE AND CLAMSHELL have long life, swing clutches for fast action. Hoist drums are mounted on anti-friction bearings. Big crawlers give super-flotation. Lighter, stronger boom increases bucket reaches.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN® ON THE MOVE

PLANTS: In Lorain, Elyria and Bucyrus, Ohio . . . **PRODUCTS:** Power shovels, cranes, draglines, clamshell, and hoes on crawlers from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity . . . **OUTLETS:** Lorain products sold and serviced by 249 distributor outlets throughout the world.

quarter of 1959 were about the same as during the preceding nine months on the national average. But they were 2.4% below a year earlier and 3.6% under the late 1957 peak, according to the Bureau of Public Roads Composite Mile Bid Price Index.

In California, New York, and South Dakota the bid price trend was down late last year, their state highway departments report to *Construction Methods*. Contractors in these states—and in others where competition is forcing bids lower despite increased costs of machines, manpower, and materials—are probably in a much tighter squeeze than in states such as Colorado, Florida, Idaho, and Oregon, where bid prices were moving higher in 1959.

Moreover, contractors are going after more distant jobs to keep their volume near the peak rate of 1958 (for highways and bridges). So in no area is the bidding picture likely to be easy—even though there's a sharp upturn in contract awards.

While the highway bid price trend by states gives a mixed picture—some down, some up in the fourth quarter of last year—the sharp increase in the number of bidders clearly reveals the increase in competition. There were more bidders per job let in the fourth quarter, compared with the third quarter, in nine of the 10 states reporting this information. And in Colorado, where the average number of bidders declined in the fourth quarter, there were still more bidders than in most of the states reporting increased competition.

Contractor bid prices steadied on heavy construction jobs let in the western states during the second half of 1959 but only after a moderate decline from the all-time high set in the last half on 1958, according to the San Francisco District Corps of Engineers' semi-annual Contract Unit Price Index. The latest value of this index is 176.58, based on the first

Highway Bidding Trends

Bid Prices Fourth Quarter '59

State	Q4 Index 1949=100	Q3 %	Compared With Year Ago %
U.S. Composite*	112.8	+ 1	— 2
California	120.1	— 12	— 4
Colorado	93.0	+ 4	+0.3
Florida	146.2	+ 10	+ 5
Idaho (1950=100)	99.6	+ 29	+ 10
Michigan	109.5	—0.4	+0.3
Nevada (1955=100)	106.2	+0.5	+ 3
New York	107.4	— 5	— 4
Oregon	95.4	+ 5	— 1
South Dakota	88.1	— 11	— 10
Texas	118.6	— 2	— 8
Washington	91.1	— 1	— 5

Competition: Bids per Contract

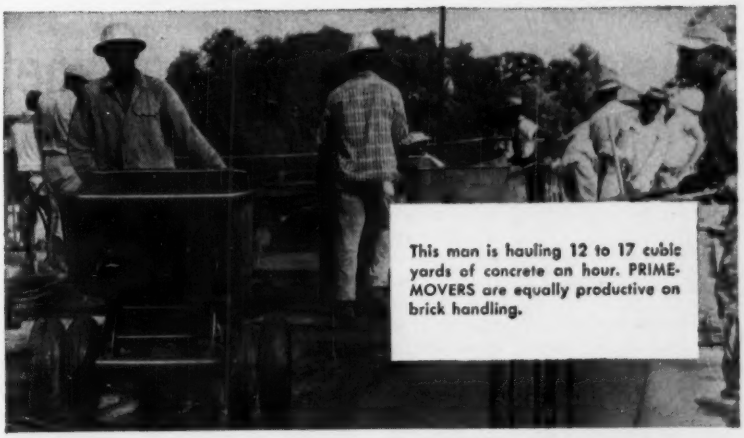
State	1958 Q3	1958 Q4	1959 Q1	1959 Q2	1959 Q3	1959 Q4
U.S.*	—6.6—		—7.4—		—na—	
California	5.5	6.3	8.2	6.3	6.7	7.1
Colorado	8.4	9.6	9.5	7.5	9.9	8.8
Florida	5.0	5.9	5.3	5.3	5.3	6.5
Idaho	5.3	7.0	7.1	4.3	4.6	5.9
Michigan	5.7	6.9	8.5	5.7	5.5	8.4
Nevada	5.7	7.1	5.7	5.0	6.6	9.5
New York	6.0	5.0	8.2r	9.2	6.2	8.0
Oregon	5.9	8.4	6.9	6.0	6.5	7.1
South Dakota	6.8	6.4	6.9	8.5	9.7	11.1
Washington	4.9	8.0	9.8	5.7	4.7	8.2

*Federal aid project—BPR
Sources: State highway departments and Bureau of Public Roads

FIRST IT WAS 4 PRIME-MOVERS

For the John Rohrer Construction Co., Kansas City

NOW IT'S 16 PRIME-MOVERS



This man is hauling 12 to 17 cubic yards of concrete an hour. PRIME-MOVERS are equally productive on brick handling.

Give your laborers the *POWER* to produce!

PRIME-MOVERS are one of the few powered tools engineered specifically for laborers' use — to triple the output on their primary function . . . handling materials! Here is an immediate and positive way to cut your costs . . . because PRIME-MOVERS are easy to put to use and simple to operate. No other phase of construction offers greater cost-cutting opportunities. Write today for job estimating data.

PRIME-MOVER CO. PRIME-MOVER MUSCATINE, IOWA

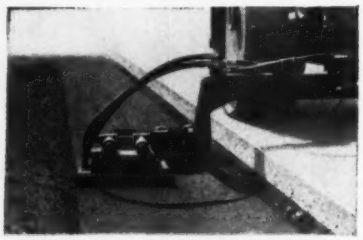
Austin-Western Roller-Compactor

Saves cost of second machine!

"Our A-W Roller Compactor does the work of two pieces of compaction equipment, saving the cost of an additional machine. It makes possible the placement of a 10-in. stone base in a single course.

"On one hilly highway job we encountered an unusually slippery limestone aggregate. The A-W Roller-Compactor was the *only* equipment we had which could compact loose material on grades of 1% or more under its own power. Without it, we would have had to tow rollers up hill to get the job done." —*W. O. Faylor, Middlecreek Construction Co., Winfield, Pa.*

Three-shoe vibratory unit attaches to Austin-Western and most other makes of 3-wheel rollers. Vibration penetrates to bottom of lift, reacts upward and effectively keys low-level material for maximum consolidation in fewest passes. Compactor attachment combines with 3-wheel roller to deliver both surface-sealing static pressure and deep-reaching vibratory action in one pass. Dependable under severest operating conditions; easy to maintain. Learn how you can reduce compaction costs. See your nearby Austin-Western distributor today or write us for facts and figures.



Vibratory widener attachment — for use with Roller-Compactor unit on most makes of 3-wheel rollers. Mounts right or left; ends need for trench roller.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

CONSTRUCTION BUSINESS .. *continued*

six months of 1946 as 100. This is a shade above the first half of last year, but it's 3% below the 1958 peak.

January irrigation and hydro costs in 17 western states and Alaska were slightly below a year ago and more than 2% under the record of January, 1958. The latest index reported by the Denver office, Bureau of Reclamation, is 1.27, based on 1949-51 as 1.00 BuRec's Composite Cost Index has been more stable during the past year than in any other 12 months since 1945, but this is largely due to offsetting increases and decreases among different types of construction and installed equipment for pumping and hydro power plants.

SOME BIG CONTRACT AWARDS OF THE MONTH

Kaiser Engineering Division of Henry J. Kaiser Co., Oakland, Calif., **Raymond International, Inc.**, New York, N.Y., **Macco Corp.**, Paramount, Calif., and **Puget Sound Bridge & Drydock Co.**, Seattle, Calif. A joint venture to construct missile launching sites with associated technical facilities near Mountain Home Air Force Base, Mountain Home, Idaho. Corps of Engineers, City-County Airport, Walla Walla, Wash. $28,899,000.

Perini Corp., Seattle, Wash., Complete construction of Mayfield Dam on the Cowlitz River near Tacoma, Wash. Dept. of Public Works, 930 S. Tacoma Ave., Tacoma, Wash. $9,997,139.

S. N. Nielsen Co., Chicago, Ill. Erect the Governor Horner Housing Project at Lake St. and Damen Ave., Chicago, Ill. Chicago Housing Authority, 608 S. Dearborn St., Chicago, Ill. $9,793,000.

Phoenix Urban Corp., New York, N.Y. Construct the first stage of a housing project at the West End Development, Boston, Mass. Charles River Park, Inc., State St., Boston, Mass. $8,400,000.

Crane Construction Co., Chicago, Ill. Erect a 28-story office and commercial building in New Orleans, La. Cushman & Wakefield, 232 Baronne St., New Orleans, La. $8,109,300.

continued on page 57

LIMA

Morris & Reimann Wreckers:

Well pleased with LIMA 44-T

"We've been in the wrecking business 28 years and our 2 year old Lima 44-T is perhaps the best mobile crane we've ever owned!" That's what wreckers Orville Morris and Nelson Reimann, Amherst, N. Y., have to say about their truck-mounted 30-ton Lima crane.

Travels city streets

"It's a fast and powerful rig. We once dismantled a 140-ft. stack in only 45 minutes with a wrecking ball attached to the Lima. It's a good traveler, too. Moves about on city streets from job to job with speed and ease.

"Lima's many special features result in important dollar savings. Maintenance costs and downtime have been very low... distributor service excellent.

"We're very well pleased with our truck-mounted Lima."

Undivided responsibility

The 44-T is a versatile 30-ton crane or a 1-yd. shovel. It can also be used with interchangeable dragline or clamshell attachments. The heavy duty 10-wheel carrier (6x4 or 6x6) is designed and built by Lima... giving you the benefit of the undivided responsibility of only one manufacturer. Two engines; choice of power.

Lima Truck-Mounted Cranes are available in capacities up to 75 tons, shovels to 1¼ yd. There's a Lima type and size to add profit on your job. Get all the facts. See your nearby LIMA distributor or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Workmen in personnel cage suspended from jib of 130-ft. boom rig line around Jamestown, N. Y., church steeple in preparation for demolition. Crane is a Lima 44-T.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON 6010

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

LIMA ROADPACKER MODEL D

Compacts Fast, Wide and Deep on Macadam, Gravel, Crushed Rock, Sand, Soil Cement and Stabilized Bases

SAVE WITH SINGLE COURSE CONSTRUCTION

Lima Roadpackers meet the challenge—no other vibratory compactor gives you so many cost-saving job-speeding features . . . the reason why Lima Roadpackers are preferred by contractors throughout the world for fast production on highway and airport construction jobs.

Compare these profit-making features!

Heavy Vibrators

Six 437 pound vibrators deliver earth-shaking vibrations for deep, uniform densities. Vibrator units are completely sealed—no external moving parts. Vibrators are self-lubricated and need no daily maintenance. Required densities are quickly achieved. Macadam rock is tightly keyed, with screenings vibrated into voids in only three applications on most jobs. Compacts up to 600 tons per hour.

Infinite Speeds

20 feet per minute to 30 miles per hour! A fluid motor propels the machine while compacting. A dial selector gives compaction speeds to match any job including new high production requirements within a broad range of 20 to 95 feet per minute. Roadpacker can be anywhere on the job at a moments notice. Heavy duty transmission provides fast highway travel speeds to next job.

One Lever Instant Reversing

Compacts forward or reverse with one lever control—no gear shifts—no declutching—no stopping. With the Lima Roadpacker you have no lost time and no depression in the material being compacted when machine is reversed.

Variable Working Widths

End shoes fold back for a selection of 4, 5 or 6 shoe working widths. Easily folded by the operator alone, the Roadpacker carries unused shoes ready for wider working widths at any time. Folded end shoes permit Roadpacker to travel over highway.

Controls Up Front

Roadpacker controls are all grouped at operator's seat—engine gages and controls are mounted on dash panel. Foot accelerator in addition to hand throttle provides natural roading of Roadpacker.

Widener Attachment

Extension arm works shoes in a widening trench to 11″ below the existing pavement. Quickly adapted to various width widening work; replaces trench rollers.

These are only a few of the advantages incorporated into the new rugged Lima Roadpacker, Model D. For complete information, see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

LIMA

Shovels—to 6-cu. yd.
Cranes—to 110-tons
Draglines—variable

LIMA SUPER ROADPACKER

For the large construction jobs such as superhighways, air bases and earth-fill dams, Lima offers the Super Roadpacker with two rows of six hydraulically controlled vibratory shoes. Compacting widths up to 15 feet.

LIMA AUSTIN-WESTERN

Crushing, Screening and Washing Equipment

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

5948

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

JAEGER ROTARY "75"

the ideal compressor for "one breaker" work

EASY STARTING IN ALL WEATHER because it's a rotary. No piston drag.

COSTS LESS YET RUNS SMOOTHER than the reciprocating type it replaces. Puts out cooler air, too.

JUST RIGHT FOR AN 80 LB. BREAKER, 75 cfm of air runs a heavy duty tool at top pressure and efficiency.

FULLY EQUIPPED with automatic blow-down valve, tool boxes big enough for full set of tools, spring-mounted truck for fast trailing.

Saves money, spares effort, speeds work. See your Jaeger distributor or send for catalog.

THE JAEGER MACHINE COMPANY, 800 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS, 75 TO 900 CFM • PUMPS • MIXERS • TRUCK MIXERS • PAVING MACHINES

New Stow Hy-Cycle Vibrator delivers *twice* as much agitation as 60-cycle types!

Striking demonstration of Stow's Hy-Cycle Vibrator power showed up on the site of Hoffman Construction's job for the City of Portland, Oregon.

Concrete walls and columns were specified for the new Municipal Recreation Center. Plans called for Walls 12″ thick, 16′ high, 150′ long and Finish Columns using 2½″ slump, 1″ aggregate concrete mix with Pozzolith and air-entrained additives combined.

No Need Here to Patch and Grout!

In constant operation 12 hours a day, the Hy-Cycle Vibrator thoroughly vibrated the stiff mix; agitating, compacting, eliminating voids and pockets. The result? Top-strength walls, smooth-finish columns—on schedule. No need here to patch and grout!

Hoffman Superintendent Ross Vickers says, "This job proved to us that Stow Hy-Cycle Vibrators are the most economical, smoothest operating vibrators we've ever used!"

WHY THE DIFFERENCE?

Stow's Hy-Cycle motor-in-head unit has ⅛″ amplitude while the 60-cycle motor-in-head unit has 1/16 inch. And Stow's Hy-Cycle vibrators have the power to maintain this amplitude even in the stiffest mixes!

ADJUSTABLE SPEED

Vibrations-per-minute can be set to suit the job by varying the HC Generator's engine speed. High speeds give you more power for dry, coarse mixes; slower speeds deliver reduced power for wet mixes, thin walls and light weight forms.

VIBRATOR MOTOR-IN-HEAD

The Hy-Cycle motor is hermetically sealed within the Vibrator Head. No brushes or commutators to wear out, thus enabling Stow to design High Amplitude into the Heads.

STOW MANUFACTURING CO.
Dept. N-1, 31 Shear St.
Binghamton, New York

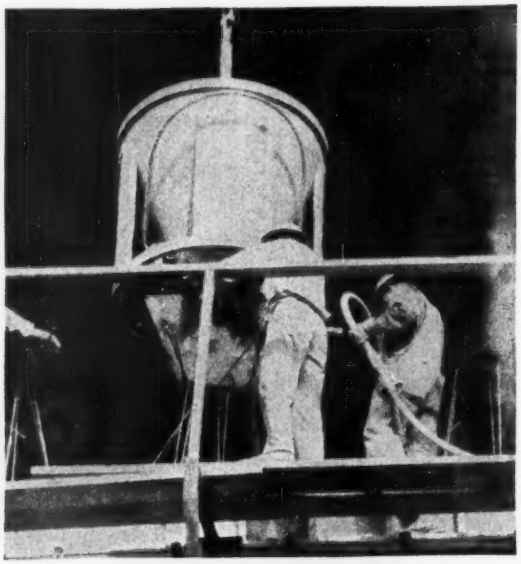
Please send me your new Bulletin 5914 on Hy-Cycle Vibrators and Generators.

NAME_____ **TITLE**_____

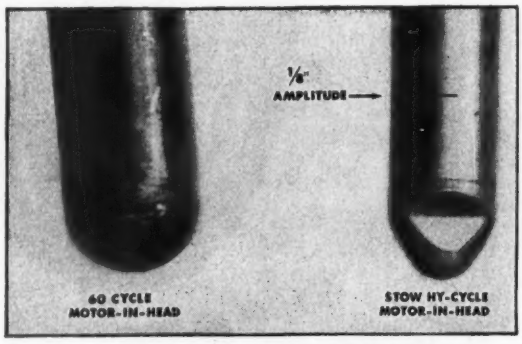
COMPANY_____

STREET_____

CITY_____ **STATE**_____

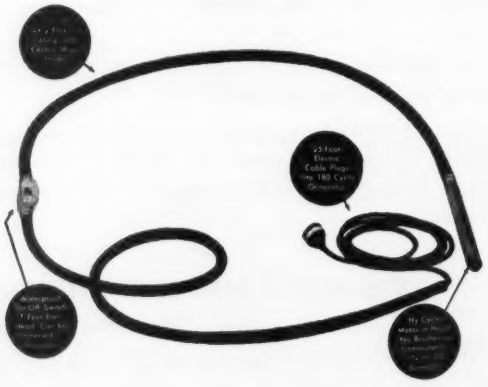


Stow Hy-Cycle Vibrator Model 175 Agitating Concrete Mix in wall farms.



Hy-Cycle Vibrator Head and 60-Cycle Head Pictured at 10,000 VPM in Air.

Note Greater Amplitude (Radial distance Head moves from Center Line) of H-C Model, ⅛″, as Compared to 1/16″ of 60-Cycle Model.



STOW MANUFACTURING CO.
31 SHEAR ST. BINGHAMTON, N. Y.

CONTRACTS AWARDED . . .

continued from page 52

Fruin-Colnon Construction Co., St. Louis, Mo. Erect a 600-unit housing complex in East St. Louis, Ill. East St. Louis Housing Authority, 810 Spivey Bldg., East St. Louis, Ill. $7,288,443.

A. E. Ottaviano, Inc., Croton-on-Hudson, N.Y. Pave 3.17-mi of the Long Island Expressway and associated approach ramps in Nassau and Suffolk Counties, N.Y. Dept. of Public Works, State Office Building, Albany, N.Y. $7,155,655.

Karl Koch Erecting Co., Inc., New York, N.Y. Reconstruction of the upper and lower deck roadways and the approach systems of the Manhattan Bridge in New York City. Dept of Public Works, Room 2200, Municipal Building, New York, N.Y. $6,384,000.

J. A. Jones Construction Co., Charlotte, N.C. Construction of diversion tunnel, outlet works, and access roads at the Summersville Reservoir Project on the Gauley River near Summerville, W. Va. Corps of Engineers, 237 4th Ave., Huntington, W. Va. $6,279,636.

Marion Construction Co., Nashville, Tenn. Erect dual plate girder bridge spans across the Cumberland River in Nashville, Tenn. State Highway Dept., Nashville, Tenn. $5,604,976.

Matich Constructors, Colton, Calif., and **W. F. Maxwell Co.**, Fontana, Calif. A joint venture to construct 6.1-mi of six-lane freeway, including extensive interchange facilities, on U.S. 7 near Banning, Calif. State Division of Highways, 1102 N. St., Sacramento, Calif. $5,543,065.

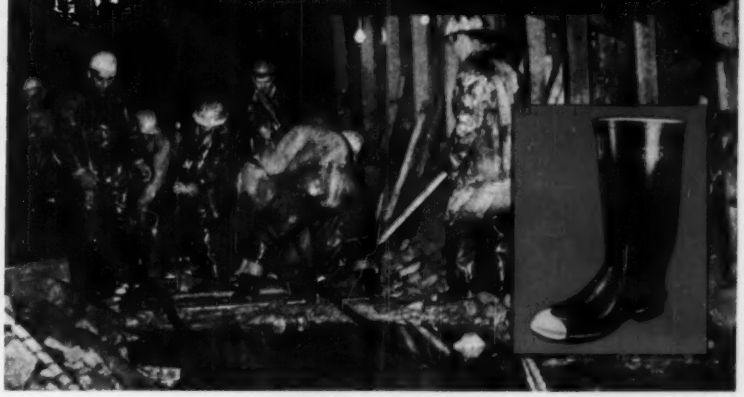
R. C. Mahon Co., Detroit, Mich. Erect steel superstructure for a bridge spanning the Ohio River near New Albany, Ind. State Highway Dept., 102 Senate Ave., Indianapolis, Ind. $5,394,929.

Kirst Construction Co., Altadena, Calif. Dredging and other improvements of the San Gabriel River Flood Control Channel near Whittier, Calif. Corps of Engineers, 751 S. Figueroa St., Los Angeles, Calif. $5,069,037.

continued on page 60

WHY DO ALL YOUR MEN WEAR THE SAME KIND OF COATS AND BOOTS?

THAT'S EASY—THEY'VE FOUND THAT GOODALL MEANS LOTS OF EXTRA WEAR AND COMFORT!



STYLE 338 COAT—Most durable of all coats for rough work and weather, yet lightweight and comfortable. Dull finish black rubber on white sheeting. Double back. Length 49".

STYLE 80-81 SHAFT SUIT—Made to withstand the hard wear encountered in tunneling and other rough, wet work. Jacket and overall of dull finish black rubber on natural sheeting, designed to assure maximum comfort. Small, Medium, Large.

"TOE-SAVER"® BOOTS—Famous for comfort, long wear and the positive protection provided by its steel safety toe, identified by white toe cap. Short, Three-Quarter or Full Hip.

Send for Catalog Describing the Complete Goodall Line of Protective Clothing and Footwear.

"If it's GOODALL, it MUST be Good!"

Standard of Quality—Since 1870

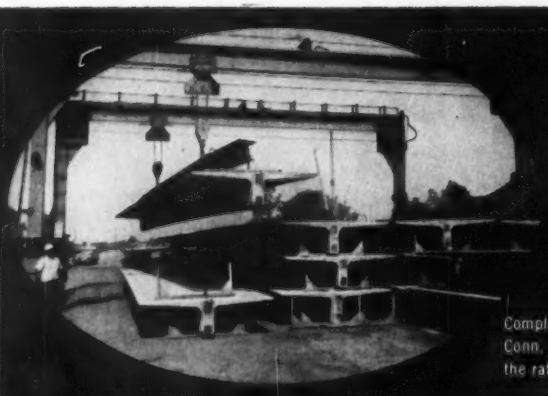
HOSE · BELTING · FOOTWEAR · CLOTHING AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES. IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

PRESTRESSED CONCRETE "T" BEAMS FOR UNIQUE PARKING DECK



Completed "T" beams at C. W. Blakeslee's Hamden, Conn. plant. They were shipped to the job site at the rate of 18 per day on trucks with special frames.

Placing beams at job site in Springfield, Mass. With each beam set at a slightly different angle, there is no more than a 4 percent grade in any part of the structure. Each beam is 8 ft. wide at the top of the "T" and only 8 in. wide at the stem.

• This new parking deck for the Forbes & Wallace department store is a striking example of the opportunities that prestressed concrete offers designers and builders.

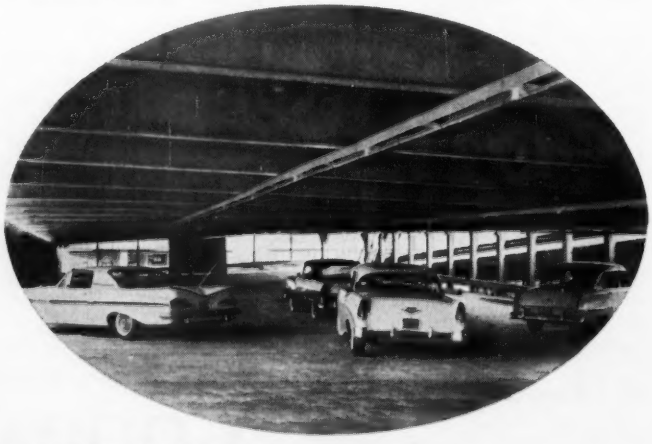
Gage and Martinson's unique design utilizes 182 ten-ton prestressed concrete "T" beams, whose 54′ lengths permit a completely post-free parking facility. Ease and speed of erecting the prefabricated concrete decks made it possible for the Ley Construction Company to open the 3½ story structure for business just seven months after breaking ground.

The manufacturer of these beams, C. W. Blakeslee & Sons, Inc. uses Lehigh Early Strength Cement for maximum production efficiency in their prestressing plant. Units are completed quickly, ready for trucking to the job site as needed.

This is typical of the advantages of Lehigh Early Strength Cement in modern concrete construction. Lehigh Portland Cement Company, Allentown, Pa.

LEHIGH CEMENTS

The 54′ spans provide ample room for angle parking on both sides of every level plus a wide center aisle for one-way traffic flow. Note complete absence of posts. The 3½ story structure can park about 350 cars at one time, and 2,000 cars in a single day.



OWNER: Forbes & Wallace, Springfield, Mass.
ENGINEER: Gage & Martinson, New York City
GENERAL CONTRACTOR: Ley Construction Co., Springfield, Mass.
MANUFACTURER OF PRESTRESSED BEAMS: C. W. Blakeslee & Sons, Inc., New Haven, Conn.
READY MIX CONCRETE FOR POURED-IN-PLACE CONCRETE: Valentine Concrete Co. Springfield, Mass.

Cat DW21-PR21 units handle rock "on the double" on U. S. 10, Montana

When Albert Lalonde Company, Sydney, Montana, was awarded a $1,537,337 contract on a four-mile section of U. S. 10 on the Interstate System, three Cat DW21 Tractors with Athey PR21 Rear Dump Wagons were purchased for hauling the rock. A. M. Stolzenburg, Superintendent, tells why: "We ran three seasons with them in rock jobs. Now that we're back in rock again, we bought some more. They're big, rugged and an easy shovel target, have a low center of gravity and are maneuverable."

Note how these features met the conditions on this job. The units had to work in limited room on benches and steep haul roads. Material handled for fill included shot rock and sandstone. On haul lengths averaging 300 yards, the units handled 275 cu. yd. an hour. At the start of the job, they worked 8 hours a day; to finish it, 16 hours a day.

New DW21 Series G now 345 HP

Now the DW21 Series G is matched to the 22.5 cu. yd. PR21 for even faster production on the toughest jobs. Compared with the model it replaced, it has new HP—345 (maximum output) for an increase of 8%. It also has 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Equally important, the horsepower increase was achieved without any sacrifice whatsoever in the excellent torque characteristics of the Cat Super-Turbo Engine.

Get the complete facts on the Cat DW21-PR21 from your Caterpillar Dealer. Ask for a demonstration. Pick a tough job—see for yourself how this giant handles the hard work!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

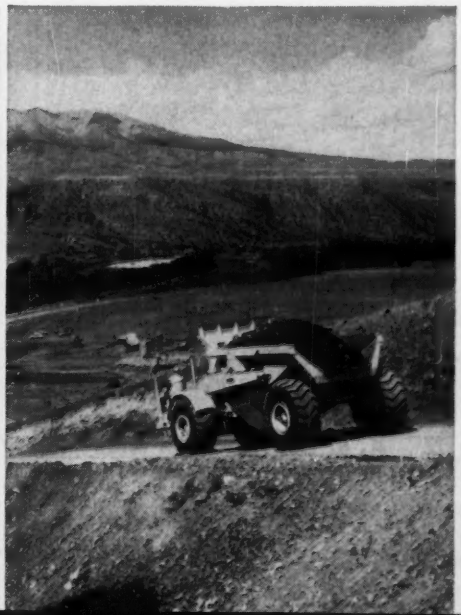
CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS

LOAD FAST! PR21 offers a big target. Short non-stop turns of DW21-PR21 unit speed spotting under shovel and work on a narrow bench. PR21's special steel withstands impact, abrasion and corrosion.

ROLL FAST! Two of three DW21-PR21 units on the job. DW21 combines high travel speed with excellent torque characteristics. The PR21 has a 22.5 cu. yd. heaped and 62,000 lb. capacity. All this adds up to fast cycles, top production.



DUMP FAST! PR21 has hydraulic hoists for quick and complete dumping of any material. DW21's hydraulic steering facilitates maneuvering. Wide-section, tubeless tires provide maximum flotation and sure traction.

Spring...

now is the time to properly light your construction hazards

USE THE

DIETZ 3 WAY HAZARD WARNING SYSTEM

LANTERNS TORCHES VISI-FLASH

Use Dietz Visi-Flash Lights to alert the oncoming driver. Brightest, safest, most trouble-free flashers on the market. Warn. "Danger Ahead" for up to 1500 hours without changing batteries.

Use Dietz Lanterns to locate hazard in relation to driver's position. Show exact location, shape, extent, and boundaries of hazard area. Burn up to 100 hours.

Use Dietz Torches to guide driver around the hazard. Fully illuminate the danger in every weather. Burn up to 48 hours on low cost kerosene

Go **DIETZ** *and you go Safely*

It's Spring . . . more highway projects . . . more traffic, too!

On your jobs . . . play it safe. Proper lighting of your highway hazards can save you many a headache – as well as money and your reputation.

NEW! **DIETZ HAZARD WARNING PLANNER**

A Practical On-the-Job Tool! Quickly and easily shows how, when, and where to use each type of warning light for maximum safety under all weather conditions and all types of roads and speeds.

Send $1. for each Planner — personalized with your name

R. E. DIETZ COMPANY
103 Leavenworth Ave. Syracuse, N. Y.

CONTRACTS AWARDED . . .

continued from page 57

Roxie Gian, Buffalo, N.Y. Erect a three-story suburban department store in Amherst, N.Y. Northtown Plaza, Inc., 210 Cornwall St., Buffalo, N.Y. $4,500,000.

Paul Tishman Co., Inc., New York, N.Y. Erect a school and hospital for mentally retarded children in Bucks County, Pa. General State Authority, 18th and Herr Sts., Harrisburg, Pa. $4,347,-786.

Joseph Skilken & Co., Columbus, O. Construct the McKinley Town and Country Shopping Center with 300,000 sq ft of floor area in South Bend, Ind. Casto Organization, 42 S. 4th St., Columbus, O. $4,250,000.

Marsolino Construction Co., Uniontown, Pa. Paving and grading of 15,800 ft of reinforced concrete highway with 10 associated bridge structures near Washington, Pa. Department of Highways, 506 North Office Bldg., Harrisburg, Pa. $4,177,525.

W. R. Grimshaw Co., Tulsa, Okla. Erect an airport terminal at Tulsa, Okla. Department of Public Works, Municipal Bldg., Tulsa, Okla. $4,062,589.

George M. Brewster & Son, Inc., Bogota, N.J. Construction of Phase 5 of lower level expansion and approach system for the George Washington Bridge in New York City. Port of New York Authority, 111 Eighth Ave., New York 11, N.Y. $3,883,843.

M. A. Gammino Construction Co., Providence, R.I. Construct a breakwater at the U.S. Naval Base, Newport, R.I. Public Works Office, 495 Summer St., Boston, Mass. $3,790,000.

D. Fortunato, Inc., Floral Park, N.Y. Erect a junior high school in Lindenhurst, N.Y. Board of Education, 350 Wellwood Ave., Lindenhurst, N.Y. $3,548,817.

H. S. Wright Construction Co., Seattle, Wash. Construct an exposition hall in Seattle, Wash. State Department of Commerce & Economic Development, 312 1st Ave., Seattle, Wash. $2,960,-934.

SPREAD FOOTINGS FOR HUGE PRATT & WHITNEY PLANT ARE DUG "IN THE DRY" IN FLORIDA'S EVERGLADES...

Pratt & Whitney Jet Engine Plant, West Palm Beach, Fla. — Contractor: Henry C. Beck Co., Atlanta, Ga.

MORETRENCH WELLPOINTS, surrounding an area 1000′ long and 500′ wide, made it possible for the contractor to construct spread footings, 12′ below ground water level, in the dry. Excavation was kept at a minimum — speeding progress on the job — cutting costs. Wellpoints remained in operation until all underground mechanical work was completed. Two 10″ Moretrench Pumps, pumping 2500 GPM each, worked continuously for approximately six months with no down time for repairs.

GOOD RESULTS · GOOD SAVINGS

These are the reasons why experienced contractors count on Moretrench Wellpoint Equipment to help them make money on wet jobs.

MORETRENCH *Corporation*

389 Main Street
Hackensack, N. J.
HUbbard 9-7676
New York Tel.: CO 7-2283

4900 S. Austin Ave.
Chicago 38, Illinois
POrtsmouth 7-4212

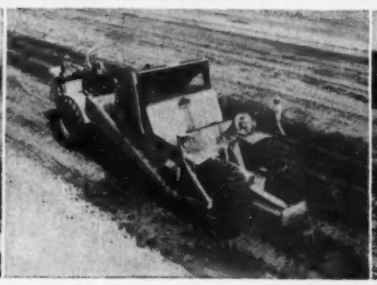
7701 Interbay Blvd.
Tampa 9, Florida
TAmpa 61-1881

315 W. 25th St.
Houston 8, Texas
UNderwood 4-7774

Rockaway
New Jersey
OAkwood 7-2100

WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington
CANADIAN REPRESENTATIVE: Geo. W. Crothers Limited, Toronto, Ontario
BRAZILIAN REPRESENTATIVE: Oscar Taves & Co., Ltd., Rio de Janeiro

PUT YARDS AH
PRODUCTION ON



See for yourself what we mean by the "Yards Ahead" performance of the Curtiss-Wright scraper line. Make your own guess of how many yards of tough clay, shale and rock are packed in the heaping bowl of this Curtiss-Wright model CW-226! Even at the most conservative estimate, you'll agree that this is the high production you want on your job. Remember, this is no ordinary machine . . . It is the CW-226—largest two-axle scraper on the market . . . one of the five that are working on Talbott Construction Corporation's Erlanger, Kentucky road construction contract . . . another job being completed faster and more profitably by the "Yards Ahead" performance of Curtiss-Wright scrapers.

CURTISS-WRIGHT CORPORATION

SOUTH BEND DIVISION, SOUTH BEND, IND.

AD NO. 52-44

SOUTH BEND DIVISION

CURTISS-WRIGHT

CORPORATION

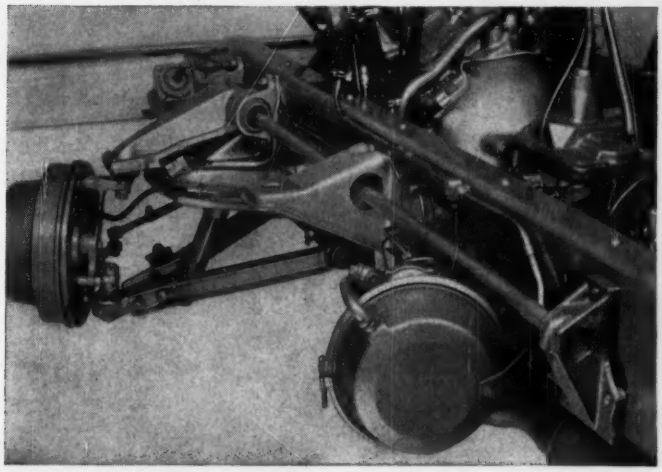
SOUTH BEND, INDIANA

CHEVY'S BIG NEW BUILD IS LIKE

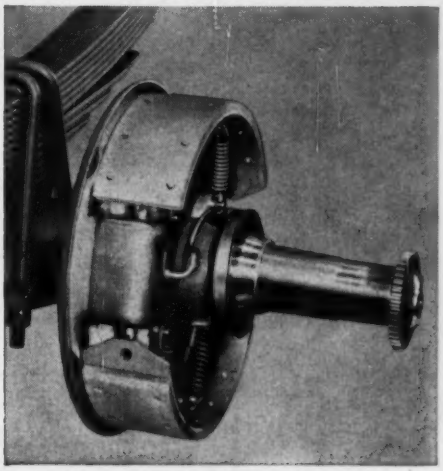
Here are some of the many ways in which Chevrolet's totally new build for '60 will work to build a bigger bank account for you. They show that a '60 Chevy means profit, through longer life, less maintenance, easier working, outsized cargoes and extra economy!

Major components of a 1960 Chevrolet truck last up to four times longer than ordinary truck parts – exhaustive testing has proved it. Likewise, the totally new cabs have proved 67% more resistant to twisting; and new frames for many models are as much as 4.8 times stronger in torsional rigidity. These are typical 1960 Chevrolet truck facts and figures – and they point up a new kind of tough truck build that helps you hang on to your dollars. And consider these '60 Chevy features from a profit-boosting standpoint:

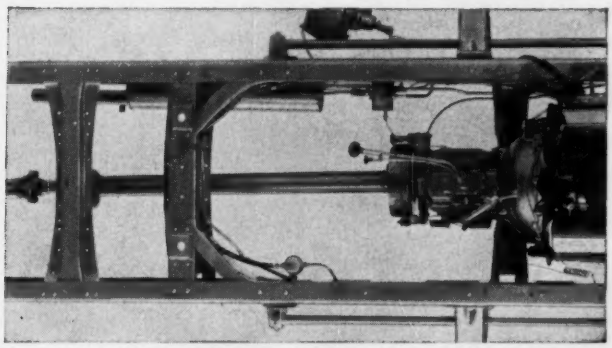
MONEY IN THE BANK FOR YOU!



New torsion-bar independent front suspension saves maintenance, increases work output. Independently suspended front wheels step right over bumps; tough torsion bar springs soak up shocks. As much as 58% of all objectionable road shock is absorbed before it reaches truck body, sheet metal or driver! And the smooth ride saves time on rough roads; means more work per day.



New Chevrolet brakes are bigger, better at bringing a loaded truck to a safe, sure stop. And the extra-wide lining wears longer – helps reduce upkeep expense. You get the best in braking in every model: choose from vacuum-hydraulic units, air-hydraulic and full-air brakes.



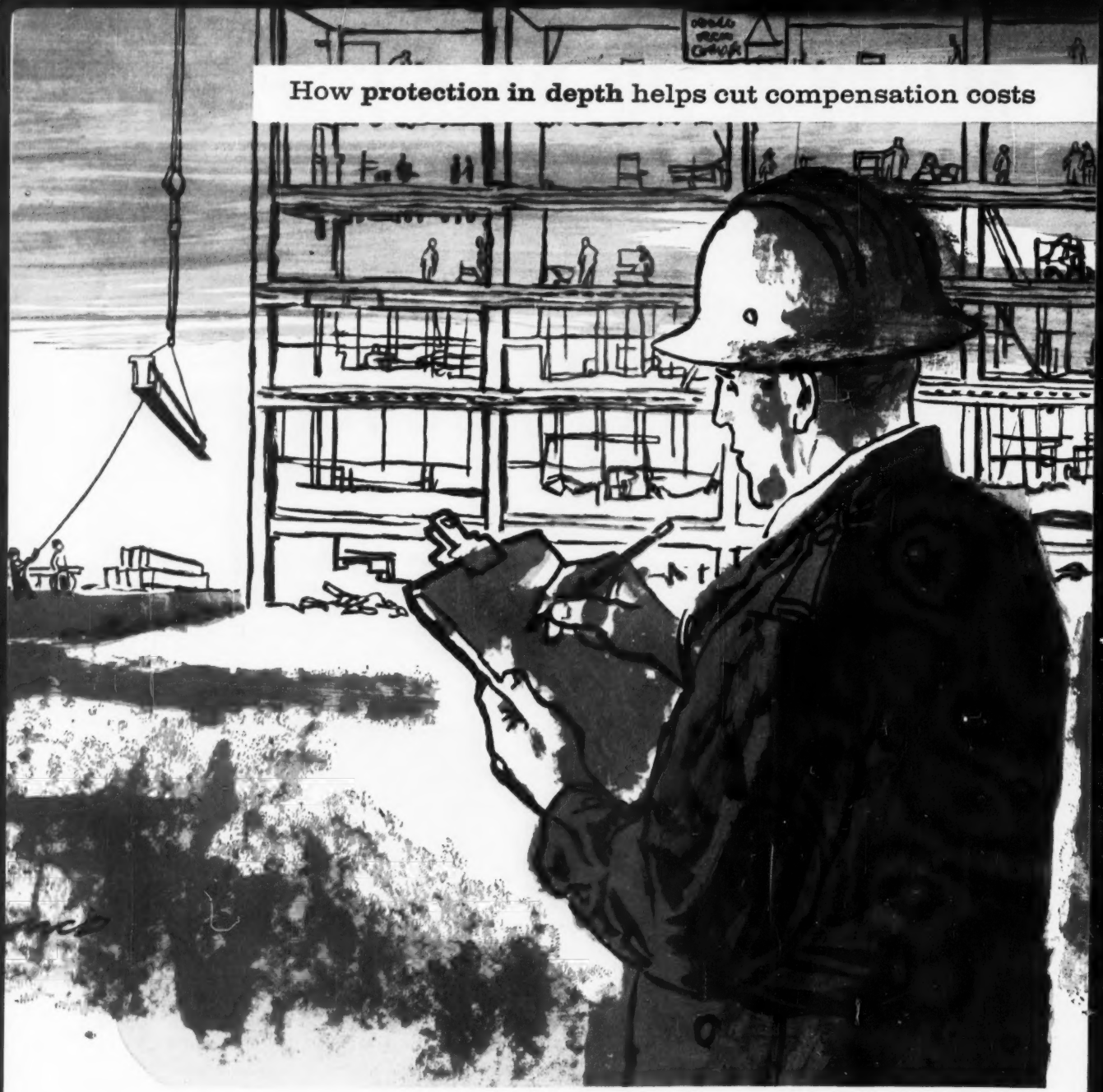
New Chevy frames with new do-the-job brawn. Box-section rail design is stronger than ever; rail section modulus has been increased as much as 57%. Massive "K" or "X" brace cross-members increase torsional rigidity and add to truck stamina; help keep you going years longer at least expense. Frames are of premium-quality, high tensile strength steel.

Precision-balanced wheels. This small balancing weight indicates that all Chevrolet truck front wheels are balanced in assembly – an advantage no other truck offers. It's assurance that Chevy handles easily and safely; that tires will last longer without shimmy and shakes from wheel imbalance.

Chevy's big new full-width hood and low-profile fenders make underhood components more accessible; servicing is faster and easier. New variable-rate rear springs come in high capacities to accommodate high payloads – and spring resistance adjusts automatically to cushion the load. You'll find, too, that 1960's savingest truck power is Chevrolet's: famous economy 6's and efficient short-stroke V8's for light-duty models . . . high-power, high-torque V8's and tough, dependable 6's for the bigger trucks. It'll profit you to see your Chevrolet dealer about Chevy's big new build, sometime soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

1960 CHEVROLET STURDI-BILT TRUCKS

CHEVROLET



Every hazard he spots can save you money

Contractors who insure with Liberty Mutual value the aid of a Liberty loss prevention engineer. His practiced eye sees hazards that others might miss. He learns every phase of your operation, understands your job plans and problems. Briefed in advance, he can help you reduce accidents and losses, keep your compensation costs down and improve worker efficiency. Safety engineering is but one of the many Liberty Mutual services that add up to protection in depth. To learn more about Liberty's protection in depth and how it can help lower your business insurance costs, get in touch with your nearest Liberty Mutual office.

Look for more from **LIBERTY MUTUAL**

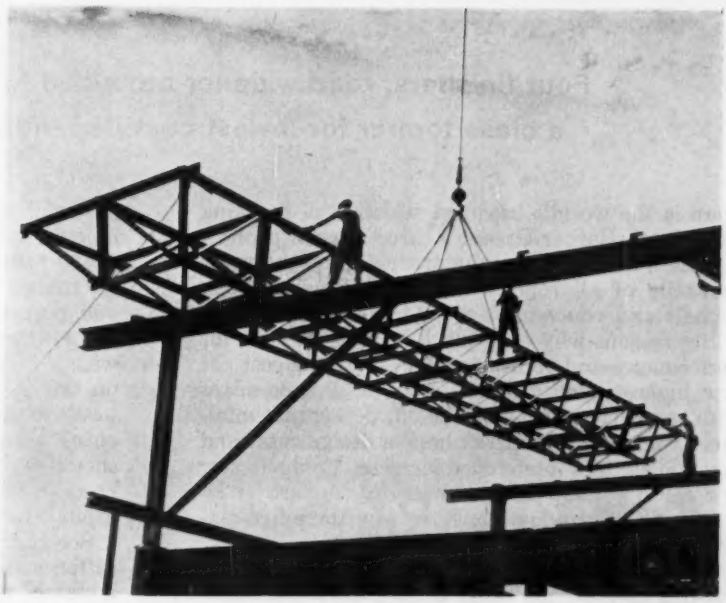
...the company that stands by you

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY
HOME OFFICE: BOSTON

Business Insurance: Workmen's Compensation, Liability, Group Accident and Health, Fire, Fleet, Crime • Personal Insurance: Automobile, Fire, Inland Marine, Burglary, Homeowners

Roof Assembled on Falsework Beams

• New Office building of The Upjohn Co. at Kalamazoo, Mich., is crowned with a 1,200-ton steel space frame. Whitehead & Kales Co of Detroit fabricated more than 200 sections in their shop and erected them on steel falsework beams bolted to the roof-supporting columns. Space frame sections, placed side by side on the falsework beams, were joined together with diagonal members attached to the top chords of one section so that they could pivot down to be connected to the bottom chords of the adjacent sections. After completion of the roof over one bay, the falsework beams were moved to another bay.



879-B FINISHER—universal machine for profitable use on any size finishing job.

No. 1 FINISHER BROADEST CHOICE,

Four finishers, road widener are sized for every need; each a class topper for lowest cost dependable performance

Here is the world's broadest selection of finishing machines—Barber-Greene's three sizes of asphalt finishers available in four models, plus the most versatile of all road wideners that paves both asphalt and concrete.

Big reasons why each machine tops its class for performance and values are: lowest paving cost per ton; highest quality construction of all type mixes with compaction before strike-off; denser mat minimizes rolling time; superior hopper design cuts hand labor; operators' preference increases productivity; and world's finest parts and service support.

This brief introduction shows why these five machines match every finishing need:

879B FINISHER—Universal machine for contractors wanting greatest job range from a single finisher.

SA-60 FINISHER—World's largest, fastest, most powerful finisher on tracks—lowest cost per ton-mile for contractors with highest capacity jobs.

SB-60 FINISHER—Same as SA-60 except it paves on rubber tires for even greater maneuverability and portability.

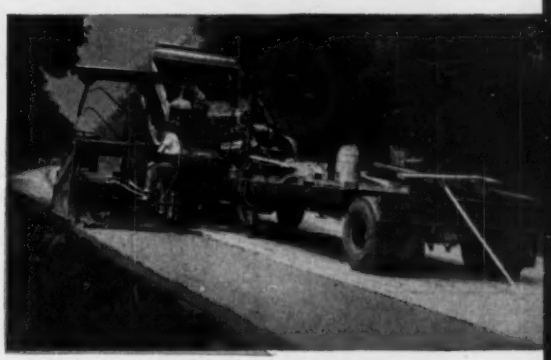
873 FINISHER—For the small or large contractor with a wide variety of small, scattered jobs. Paves on tracks, travels on rubber.

SJ-50 ROAD WIDENER AND PAVER—Only machine that handles all types of widening and shoulder paving with all materials, including concrete. Exclusive tamping-leveling attachment for asphalt paving.

See your nearby distributor for the demonstrable difference in a Barber-Greene finisher or road widener, the asphalt paving machines that have been best sellers since 1938.

SB-60 FINISHER—world's largest finisher on rubber delivers lowest cost per ton mile on your biggest jobs. SA-60 identical except crawler mounted.

873 FINISHER—Only small track-mounted finisher, travels on rubber to handle scattered jobs most profitably.

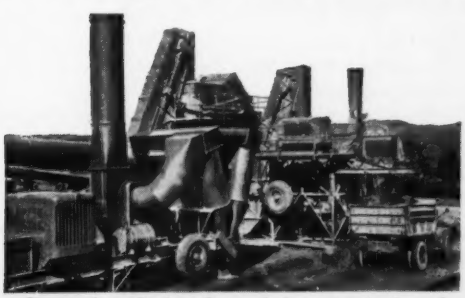


SJ-50 ROAD WIDENER-PAVER handles all types of widening and shoulder paving with all materials, including concrete.

LINE OFFERS YOU BIGGEST VALUES

EXCLUSIVE BARBER-GREENE FINISHER FEATURES

- Highest quality mat obtainable through tamping-leveling principle with compaction before strike-off
- Self-cleaning hopper design
- Unobstructed visibility to hopper, spreading screws, joints or road edge, and truck
- Proved ability to lay all types of mix



Choose from Barber-Greene's largest selection of 17 continuous and batch-type mix plants to complete the most profitable paving package available.

World's No. 1 Manufacturer of Asphalt Paving Equipment

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Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.
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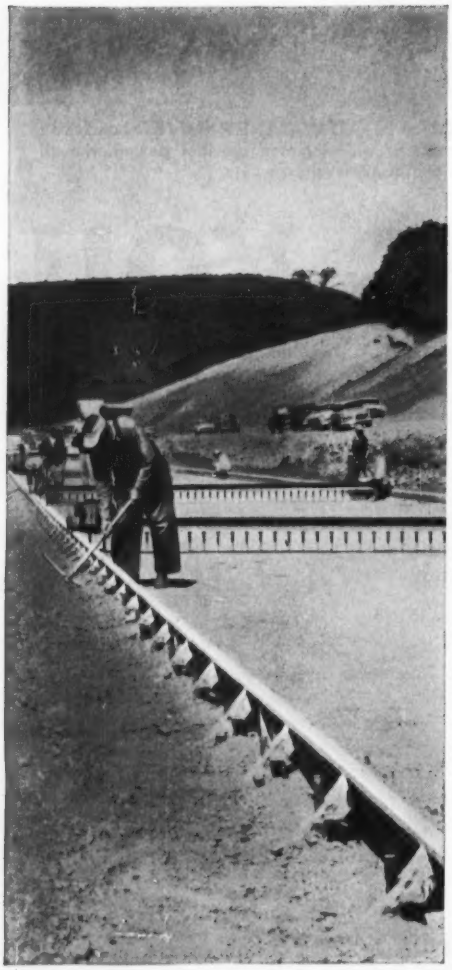
CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

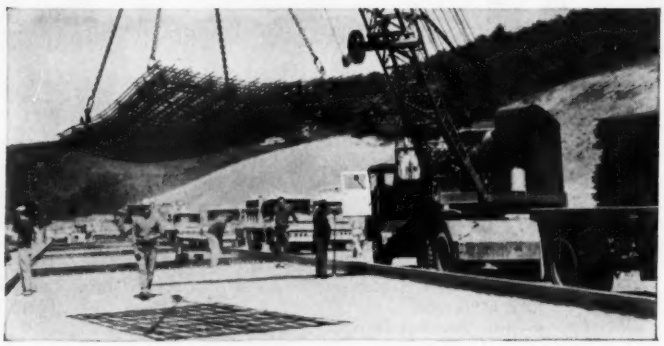
Paving the Penn-Can Highway



Welcome addition to Pennsylvania's fast-growing system of superhighways is the new Penn-Can Highway, stretching from Stroudsburg north to the New York State line near Binghamton.

Part of the Interstate Highway System, the new road will be concrete, generally four lanes wide, with a 60-ft median strip.

Shown here is the Lycoming Construction Co., Inc. of Williamsport, Pa., paving a section of the Penn-Can Highway near New Milford. A number of Bethlehem steel products for highways were used in constructing this section, including reinforcing steel for pavements and structures, dowel units, hook bolts, guard rail posts, cable guard rail, beam guard rail, and wire rope.



Single Source for Highway Steels

Bethlehem supplies the largest line of steel highway products in the country. Beginning with steels for the right-of-way, on through steel products for drainage systems, bridges, tunnels, road-paving, and bridge and highway guard rails, you can get all your highway steel products from one source—Bethlehem.

Write or phone the nearest Bethlehem sales office for full details. No obligation to you, of course.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

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TORQUE · PERFORMANCE · DEPENDABILITY

BUY A... **SIOUX**

AIR or ELECTRIC

IMPACT WRENCH

Air impact wrenches deliver

up to 15% more torque

while consuming 30% less air!

NO. 322

Superiority of their mechanical design is revealed in the unusual efficiency of SIOUX Air Impact Wrenches. Wrench for wrench, model for model, size for size, SIOUX can be counted upon to deliver an average of 15% more torque, while consuming 30% less air! Less power is absorbed by the wrench itself. More is applied to the drive. Three SIOUX wrenches can be operated on the existing air supply for every two of another kind. This correctness of engineering design has also produced a wrench of superior endurance, longevity, and freedom from trouble. Low first cost, higher torque, lower air consumption and long trouble-free life add up to make SIOUX THE BIG BUY IN AIR IMPACT WRENCHES!

No guess work with . . . . CERTIFIED SIOUX POWER

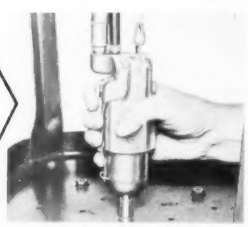
When it's a SIOUX, you know what it will do! SIOUX tells you the torque your air or electric impact wrench will deliver. You don't buy just a wrench. You buy certified SIOUX power, reversible power, and on air wrenches controllable power through eight point power selector.

REACTION BALANCED for Less Vibration Feed Back

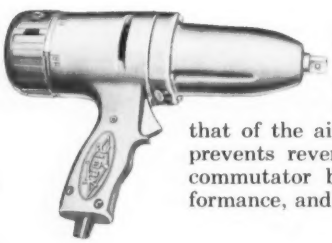
All SIOUX Impact Wrenches are "reaction balanced" for less vibration and torque feedback and for minimum operator fatigue. There's less shock and twist when the wrench impacts. You can feel the difference!

A SIZE FOR EVERY NEED!

From the big No. 322 SIOUX Air Impact Wrench (upper left) capable of up to 1,000 foot pounds of torque at 90 pounds of air pressure, to the little No. 313 (pictured at right) which weighs 2½ pounds and can deliver up to 80 foot pounds of torque, there's a full range of SIOUX impact wrench sizes and models.



SIOUX Electric IMPACT WRENCHES



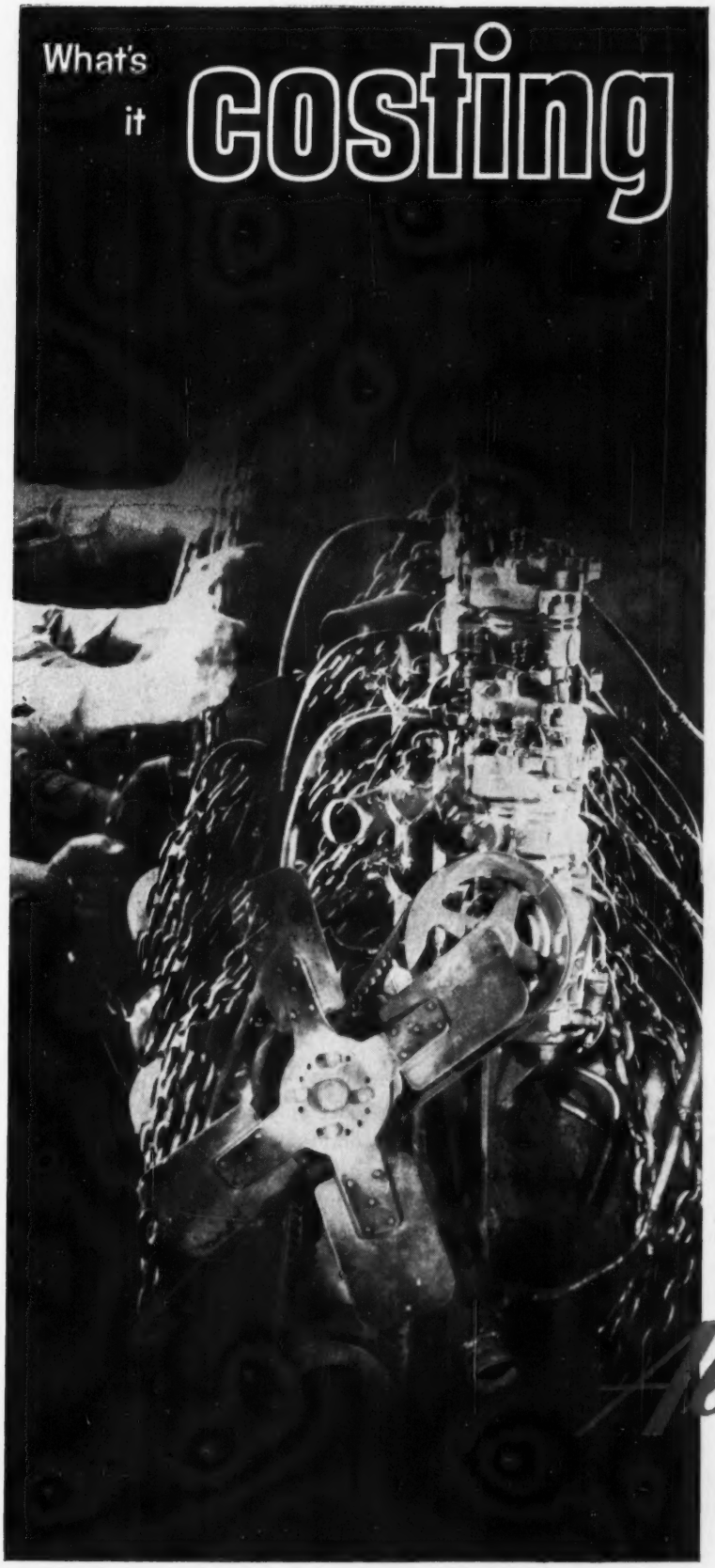
SIOUX Electric Impact Wrenches offer equal power in right or left hand rotation. The torque for each wrench is stated and certified. Their mechanical design offers exactly the same advantages as that of the air wrenches. Their exclusive reverse cap switch lock prevents reversing with the current on, and eliminates burning commutator brushes and switch contacts. Their efficiency, performance, and freedom from trouble are unexcelled.

Look under **"TOOLS, ELECTRIC"** *in the Yellow Pages*

ALBERTSON & CO., INC.

SIOUX CITY, IOWA • U. S. A.

AIR IMPACT WRENCHES • AIR SCREWDRIVERS • ELECTRIC IMPACT WRENCHES • ELECTRIC SCREWDRIVERS • DRILLS • GRINDERS • SANDERS • POLISHERS • FLEXIBLE SHAFTS • PORTABLE SAWS • VALVE GRINDING MACHINES • ABRASIVE DISCS



you to doctor tired engines?

Good as today's engines are, the cost of operation is a whale of a lot higher than it has to be if you're still using old-fashioned equipment with clutch pedal and clash-box.

For with a hydraulic drive – like Allison's TORQMATIC – you can free your engines from the shock-loads and strains which stick-shifts cause.

You see, TORQMATIC DRIVES extend engine life by virtually eliminating one of the main causes of engine wear – lugging. And they get more work out of an engine, too, because there's no power lag when the driver shifts.

SAVE MONEY AUTOMATICALLY

What's more, TORQMATIC eliminates all engine-disconnect clutch repairs – saving owners of big equipment an average of $800 a year in parts and labor. It saves up to $2,000 in equipment damage every time you train a rookie in operating big equipment – practically eliminates high repair bills for unavoidably shock-loaded drive lines and axles.

Just from the operating cost angle, the man with TORQMATIC advantages–who thinks about *total* cost, not just first cost – figures to head off a lot of competitors. Interested? See your equipment dealer today or write Allison.

Allison Division of General Motors
Indianapolis 6, Indiana

In Canada: General Motors Diesel Ltd.,
London, Ontario

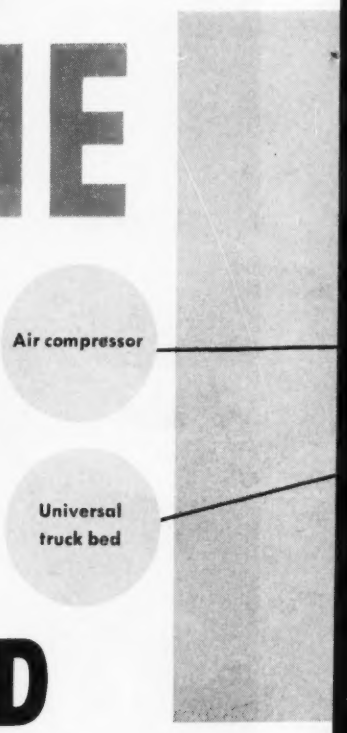
Allison TORQMATIC

TORQMATIC® DRIVES

THE MODERN DRIVE FOR MODERN EQUIPMENT

"Speed Up" with an Alemite

LESS DOWNTIME MORE JOB TIME



FOR YOUR SPREAD

BRINGS POWER LUBRICATION DIRECTLY TO EQUIPMENT...ON THE JOB!

When an Alemite Portable Service Station rolls up to your equipment on the job, it delivers fast, one-stop service that gives you two important benefits.

You eliminate costly downtime and get more working minutes per hour from every unit. And you reduce chances of costly bearing failure because your spread gets proper maintenance at regular intervals.

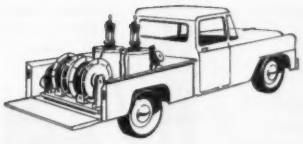
Alemite Portable Service Stations can be tailor-made according to the size of your operation and types of equipment to be serviced, operating conditions, and drum size used. Service equipment can be skid-mounted, or (as shown above) permanently mounted on a truck bed.

These efficient service rigs can be equipped to provide complete lubrication . . . to handle water service . . . and to furnish air for inflating tires, for jet cleaning, and for paint spraying.

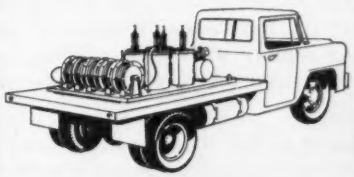
Let Alemite bring you important savings in time, money, and equipment! Write for free bulletin completely describing Alemite Portable Service Stations and equipment.

Portable Service Station...

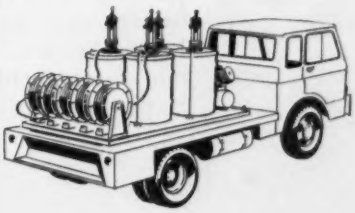
THREE SKID-MOUNTED ALEMITE PORTABLE SERVICE STATIONS SHOWN ARE EQUIPPED WITH THE FOLLOWING COMBINATIONS OF SERVICE EQUIPMENT:



2 pumps, 2 reels, 120-lb. drums



4 pumps, 5 reels, 120-lb. drums



4 pumps, 5 reels, 400-lb. drums

Symbol of SW Excellence

ALEMITE
DIVISION
STEWART-WARNER
CORPORATION

DEPT. P-30, 1850 DIVERSEY PARKWAY, CHICAGO 14, ILL.

Superhighways start here

After the planning's done, it takes "axle action" to get America's huge road-building program under way. Rugged, powerful action by thousands of axles on heavy equipment working 'round the clock . . . through all types of terrain . . . frequently subjected to overloads. To minimize costly axle shaft failures, use U.S. Axle Shafts. Finest alloy steels, precision-made by exclusive U.S. processes, guarantee "*extra-duty*" durability . . . reduce maintenance . . . protect your profits. Build *and* replace with the toughest, longest-lasting axle shafts on the market—U.S. "Extra-Duty" Shafts!

Get exact U.S. replacements for every vehicle through your jobber — or contact us for custom-engineered original equipment shafts.

FREE: Valuable booklet, "Causes and Prevention of Axle Shaft Failure" — send for yours today!

THE WORLD TURNS ON U.S. AXLES

THE US® AXLE COMPANY, INC.

Since 1920 • Pottstown, Pennsylvania

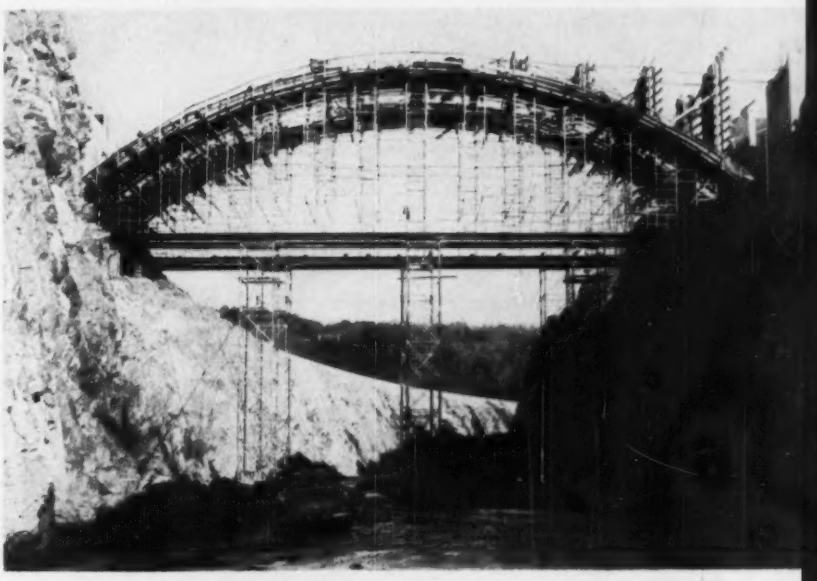
Construction News in Pictures . . .

At the Capitol

Steel erection crew swings a heavy truss 36 ft long into position for a building that will house offices of members of the House of Representatives in Washington, D.C. The truss makes possible wider column spacing in the lower floors. Bethlehem Steel Co. is fabricating and erecting 23,000 tons of structural steel for the new office building.

Sled Carries Pipeline

End of pipeline rides in a concrete sled to a barge unloading platform 1,000 yd offshore in San Diego Bay. Winches on barge pull the pipeline along the bottom; rubber hose at end of line travels in a rowboat. San Diego Gas & Electric Co. devised the method to install pipeline between offshore unloading platform and fuel oil storage area.



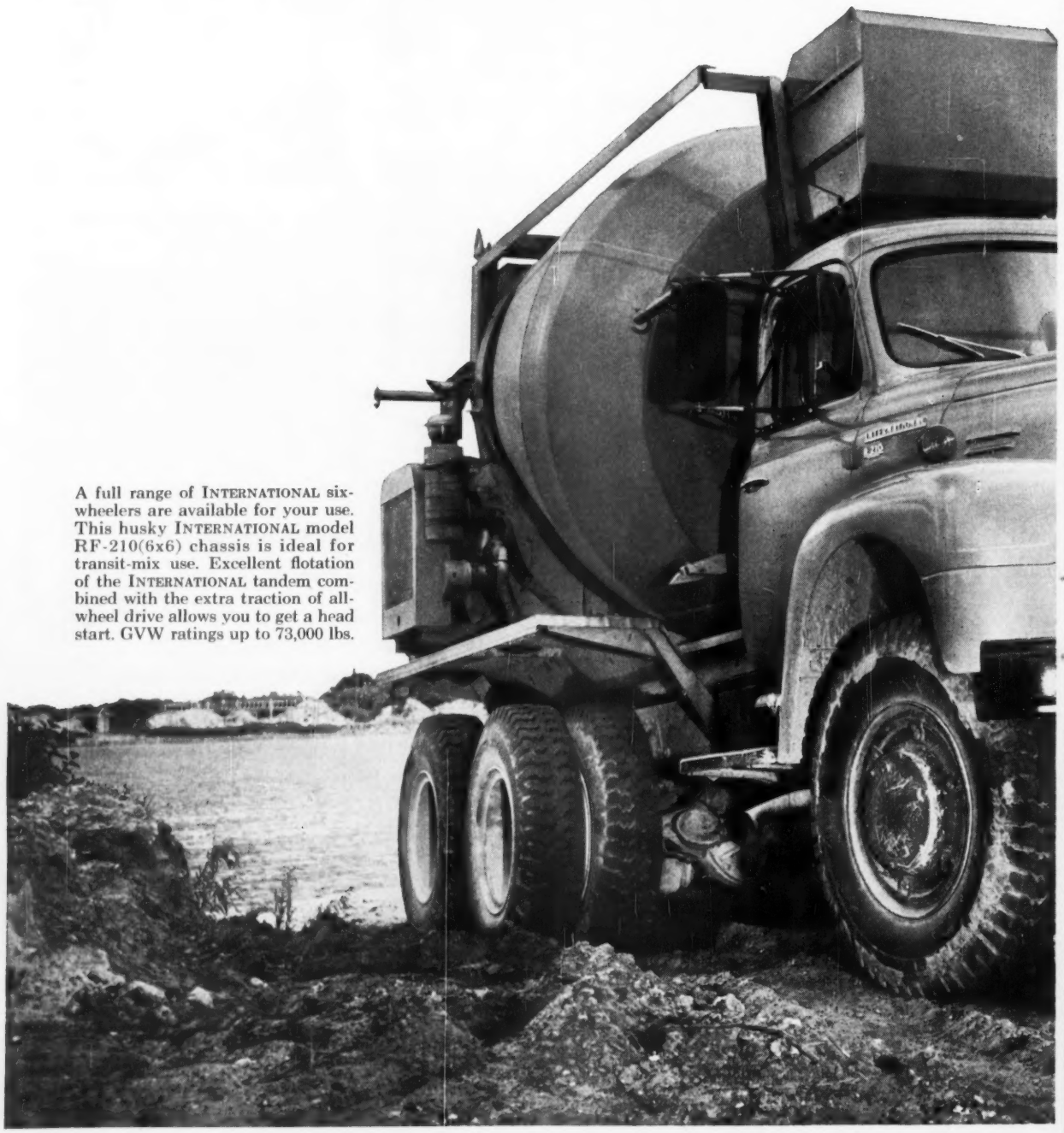
Two-Level Shoring

Six towers of extra heavy duty Patent Scaffolding 48 ft high hold I-beams that carry Trouble Saver shoring frames for two ribbon arches 8 ft wide, 1½ to 3 in. thick, and 34 ft high at the center. The job is a 143-ft-long concrete bridge at Hogback Dam near Riverton, Conn. The contractor is White Oak Excavators of Plainville, Conn.

continued on page 80

TRACTION when and where you want it

WITH INTERNATIONAL TANDEM-AXLE ALL-WHEEL-DRIVE CHASSIS



A full range of INTERNATIONAL six-wheelers are available for your use. This husky INTERNATIONAL model RF-210(6x6) chassis is ideal for transit-mix use. Excellent flotation of the INTERNATIONAL tandem combined with the extra traction of all-wheel drive allows you to get a head start. GVW ratings up to 73,000 lbs.

Now you can get to the job with heaviest payloads—and equally important, get out to come back for more—with INTERNATIONAL six-wheel *all-wheel-drive* chassis.

Schedules are met smoothly because INTERNATIONAL supplies the ideal combination of big, tough axle and frame for maximum payloads . . . and all-wheel drive to ease out of time-consuming bog-downs.

You can sell customers better service with INTERNATIONAL *all-wheel-drive* chassis. They add new flexibility to your fleet, new versatility to your business operations.

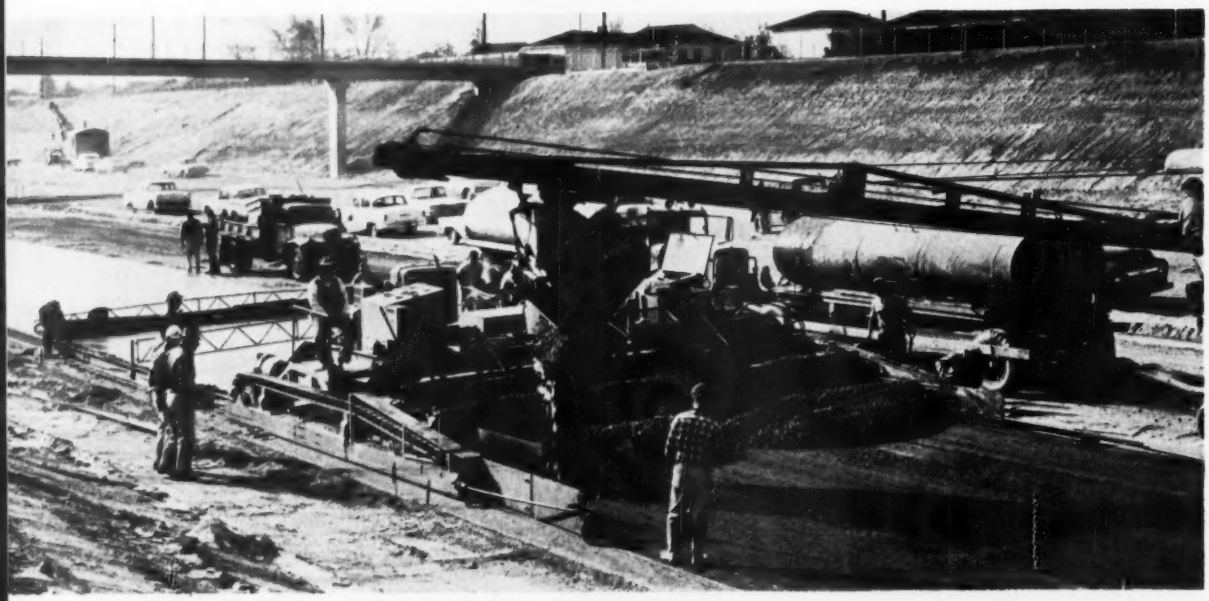
All-wheel-drive chassis are available with up to 501 cu. in. gasoline engine or optional LPG engine. Power steering, or any special feature you may need, is available, too. See your INTERNATIONAL Truck Dealer today.

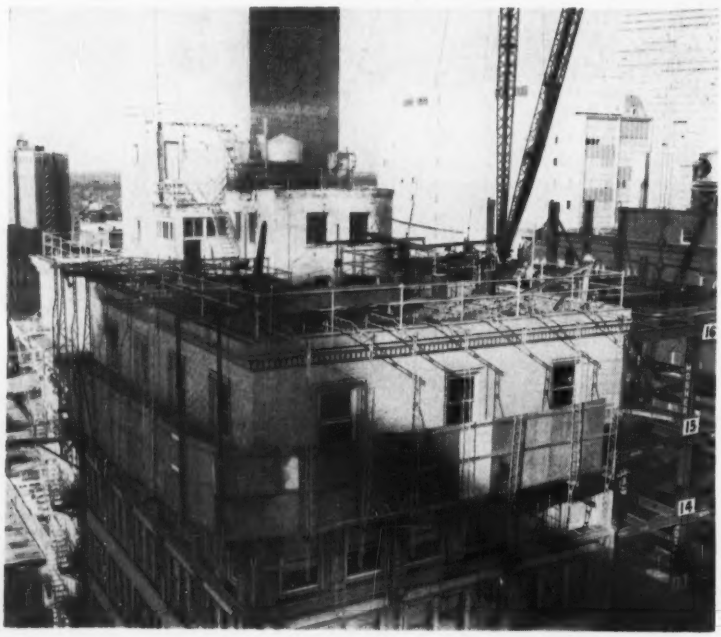
INTERNATIONAL® TRUCKS WORLD'S MOST COMPLETE LINE

INTERNATIONAL HARVESTER COMPANY • Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

Shoulder Building

Road widener pushes dump truck hauling aggregate for 5-ft shoulders of a road near West Seneca, N.Y. Contractor Robert C. Kramer of Holland, N.Y., builds a compacted depth of 4 in. with the Blaw-Knox machine. They place and compact a layer of aggregate, spray it with asphalt, then spread and compact a top layer of fine aggregate.





Slipform Production

On the Harbor Freeway in Los Angeles, a Rex slipform paver is laying about 3,000 ft of pavement 24 ft wide and 9 in. thick per 8-hr day. Ten Maginniss internal vibrators are mounted on the rig to assure meeting density specs. Ukropina, Polich, & Kral in a joint venture with J. E. Haddock, Ltd., have the $8-million construction contract.

Starting at the Top

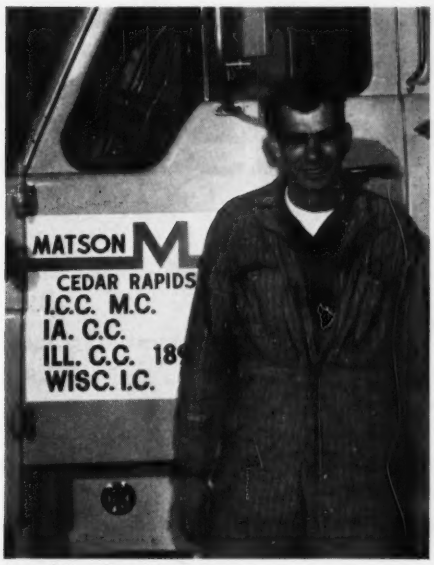
Cantilevered scaffold, hung from the top of a 15-story building in Dallas, enables Henry C. Beck Co. to remove the cornice of the building safely. Working from the top down, Beck will strip the Praetorian Building to its steel frame, tie it to a 17-story addition next door, and enclose the enlarged building with a curtain wall.

400,000 miles without failure on their first LaCrosse Trailer-

Matson, Inc. owns 11 now

Matson, Inc. has traveled 400,000 miles with the above LaCrosse Lowbed, hauling such loads as this 25-ton scraper. Never a failure since the trailer was put in service in 1954.

This huge quarry truck was hauled from near Boston, Mass. to Iowa City, Ia. on a LaCrosse Lowbed. Annually, Matson's 11 LaCrosse trailers each average 80,000 miles.



Loren Baker, Superintendent
MATSON, INCORPORATED

Rarely does a trailer manufacturer have the opportunity to dramatize product quality—yet, the very factor that permits LaCrosse owners like Matson, Inc. to establish such outstanding performance records as the following—stems from such quality . . .

Loren Baker, superintendent of this Cedar Rapids hauling firm, says: "We bought our first LaCrosse lowbed trailer in 1954. It has seen over 400,000 miles service and we've never put a weld on it.

"We're racking up more than 800,000 miles per year on our *11* LaCrosse trailers, hauling power shovels, scrapers, tractors and rock crushing equipment into 39 states. Haven't had a failure on any yet.

"Besides, the gooseneck is low, so that a big scraper can be easily hauled in conformance with the 13′ 6″ clearance regulation in most states.

"Big tail lights, smooth hauling characteristics are other features we like."

Matson purchased 5 LaCrosse Trailers in 1959 . . . kind of like betting on the winning horse.

Facts like these show why LaCrosse Trailer sales zoomed 40% in 1959. Each is backed by a full one-year warranty in writing. Here's how to get complete information.

LaCROSSE

LEADERS IN LOWBEDS

LaCROSSE TRAILER CORPORATION

418 Gould Street • La Crosse, Wisconsin

The season's

Geo. M. Brewster & Son, Inc solution includes use of one dozer, this big 375 hp Michigan, to spread 25,000 yds daily on 3 fills

How would you handle a job where the state-specified borrow pit was on an island and the main fill was across 400 ft of river water . . . and where there were no bridges in between?

This was the puzzling problem faced by bidders on a 1,400,000 yd, 4 mile section of Route 129 Freeway near Trenton, New Jersey.

Think about it. What *would* be *your* method of bidding?

Would it be dredging? Some firms figured that way. Or building high trestles above the river to serve as haul roads? Or using barges to ferry fill across the water? Or what?

Flood danger makes speed essential

The successful bidder in this case had a different solution —one as novel as the problem. Geo. M. Brewster & Son, Inc, well-known Bogota, N. J. contractor, placed their bid, roughly $4,500,000, on a gamble. They would dam the inside channel of the river on its upstream side, let the water drain, then build several inexpensive earth causeways to the mainland fill area. The question was, "Could they move the necessary dirt quickly enough to avoid high water, yet economically enough to do the job at a profit?" For this river, the Delaware, has been known to rise at least 15 ft above its present normal stage. The bid was low . . . the job won . . . but speed became absolutely vital.

Fast mobile equipment and two 10-hour shifts per day were the basic choice. Yet for economy reasons a relatively small fleet did all work. A tractor-pulled and pushed belt-loader did the loading. Ten 16-yd bottom-dumps moved the fill. One machine—a high-speed 375 hp Michigan

most unusual job

Model 380 Tractor Dozer—handled *all* spreading.

Michigan replaces 2 or 3 crawlers

Brewster figures that because of its 25 mph speed and its power, the big Michigan replaced two or three large crawler dozers. *Working alone, it easily handled three separate dumping areas.* One pass forward leveled each long line of dumps . . . one in reverse back-bladed . . . then the Michigan would drive to another fill area where the operation would be repeated.

Tires help compaction

In this way, the one 375 hp unit took care of all 10 haulers and all fills. It regularly spread 25,000 yds of soft silty sand every 20-hour day. Despite high production demands, it even had time to clean up and make extra compaction passes. In fact, Brewster figures the large low-pressure tires on his 75,000 lb Michigan did the bulk of the compacting—even though the New Jersey Highway Department required final use of vibrating rollers.

Unit also reduces maintenance

In the final analysis, dirtmoving completed long before flood season, use of the big Michigan had cut costs in some extremely important ways. One, it alone did the work of several of the biggest crawler-dozers. Two, it completely eliminated track maintenance and repairs, which in sand like this, could total $10 per hour, or more! Three, it proved versatile enough to spread gravel sub-base as well as sand fill, handle emergency truck towing, and do much of the compaction on all 3 fills.

Michigan job-proved Tractor Dozers could do the same for you! Pick the size to fit *your job*—162, 262, 375 or *600 hp*—then call your Michigan Distributor for a demonstration. You name the time and place.

CLARK EQUIPMENT

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road, Benton Harbor 16, Michigan
In Canada: Canadian Clark, Ltd., St. Thomas, Ontario

Loading rock, 4½ yd Michigan does job of 2½ yd swing shovel.

"Unique" solution provided by rubber-tired Tractor Shovel on $6-million earth and rock job

Michigan handles swing shovel, dragline, and crawler-dozer work—as well as customary truck-loading

List & Clark Construction Company, of Kansas City, Missouri, has turned up what they consider a "unique" solution to an integral part of a $6-million earth and rock moving problem. They are applying a rubber-tired 4½ yd Tractor Shovel to tasks formerly handled by rock-loading 2½ yd swing shovels, a 2½ yd dragline, and a crawler dozer.

The machine is a Michigan 262 hp Model 275A used at first for the customary job of loading half a dozen 15 to 25 yd haul units. This task, and all others, are on List & Clark's 12,000,000 yd Stage III contract on the $90-million Tuttle Creek Dam near Manhattan, Kansas.

Michigan loads 4,000 yds of shot rock per day

"Basically, we bought the Michigan to truck-load fine-grain sandy silt and clay used in the dam's impervious core," explains Mr. J. M. Clark, List & Clark vice-president. "However, the machine arrived just when a big push was underway to complete the crushed stone blanket on the west end of the project. We thought the Michigan *might* boost production and lower costs, so tried it out." Here are the results . . .

First, the Tractor Shovel went to work loading shot limestone in the spillway channel. Production was so

good, 4,000 yds per day, the Michigan replaced a 2½ yd swing shovel.

Second, as the crushed stone stockpiles grew, the Model 275A took on the chore of loading 15,000 yds of blanket stone material previously handled with another 2½ yd swing shovel.

262 hp Tractor Shovel replaces dragline

Next, the versatile Michigan was moved onto diversion channel floor cleanup. Here, 17 ft below river level, it replaced a 2½ yd dragline! This area, 160 ft wide and 4,000 ft long, was covered with varying depths of wet silt and sand laying on top of bedrock.

"We learned quickly that the high-traction Model 275A could wade through the wet channel bed material, and load it out much more efficiently than the dragline," says Mr. Clark. "The dragline lost its effectiveness when we got close to bedrock; the Michigan even here did a thorough, fast job."

Track wear no longer a problem

"The rubber-tired Michigan was our solution to heavy track wear encountered on still another job," says Mr. Clark . . . "loading out the sandy silt placed on the river bank by dredge and surge pipe. Naturally, with the Model 275A on the job, track repairs were no longer a problem."

Maneuverability—key factor

The Michigan was also used *as a dozer* in the hydraulic discharge. This dozing of solid material mixed with water required rapid changes in machine direction to get the maximum of solids before water washed them away. According to the general superintendent on the job, the Michigan's torque converter and no-clutch power shift transmission provided just what was needed. Unit worked continually in second gear, forward and reverse, dozing at speeds up to 7½ mph.

Resale value—tops

"When purchasing a machine of this size, there are a lot of things to consider. Other than the quality and work-ability of the Michigan, there was an additional major advantage," says Mr. Clark. "We found that resale and/or trade-in value of Michigans were unusually high. (*Actual figures show that after four years' use, many Michigan Tractor Shovels have returned 80% of their original purchase price.*) Knowing that our investment was thus so well protected—and looking at *all* the other facts—our decision to buy a Michigan was easy."

No-obligation demonstration

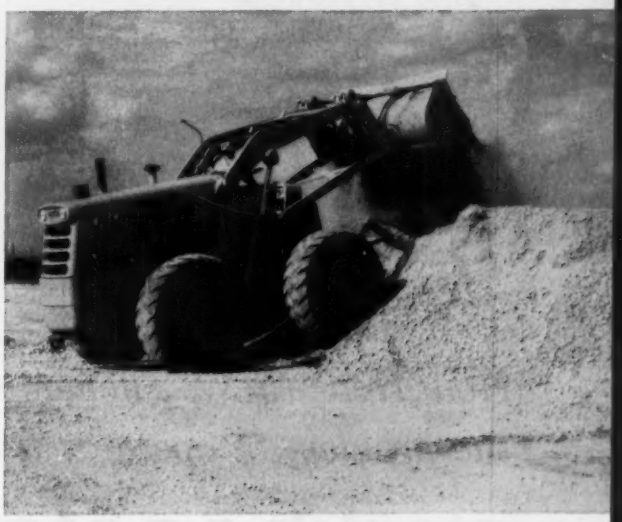
Perhaps *you* could use Michigan Tractor Shovel versatility and capacity to increase efficiency *on your job*. There are nine Michigan models to choose from—16 cu ft to 6 cu yds, 3,000 to 30,000 lb lift capacities. Call us . . . we'll be glad to demonstrate any of them.

Michigan is a registered trademark of

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road, Benton Harbor 17, Michigan
In Canada:
Canadian Clark, Ltd., St. Thomas, Ontario

Dozing sandy silt, the 262 hp Michigan has eliminated costly track wear previously experienced. Wide-base 29.5-29 tires provide excellent traction, flotation.



Model 275A shapes crushed stone stockpile prior to truck-loading 15,000 yds. Michigan 28 mph mobility lets it get around fast to handle heavy production jobs wherever the need arises.

Here's where the Michigan power-shift transmission, high work speed, and maneuverability really paid off! Working in the hydraulic discharge, solids were dozed out *before* water carried them away.

Michigan-push loads 19 yd Michigan-bowl in 30 seconds. Material: abrasive "dead" sandy marl.

How Howard W. Thomas Corp. licked the problem of operator inexperience

and boosted production

Like you're doing right now, Mr. Howard Thomas of East Bradenton, Florida, was reading a job story. A job story about the new Michigan Tractor Scraper line. Told, among other things, how the Michigans packed in more pay yards than comparable machines. Also, how their all-Clark power trains, with power shift transmission and torque converter, were producing higher average haul speeds.

Of course you don't buy scrapers from a magazine story alone. But you often check the facts first-hand. In this case, Contractor Thomas asked his Michigan distributor, Linder Industrial Machinery Co of Lakeland, for a demonstration. Of three Michigan Scraper sizes (10½, 19, 29 yds), they picked a 19 yard Model 210 as best suited to Thomas' needs. It was tested. Thoroughly. It did *even better* than the job story said it would. Mr. Thomas bought it! *And* he bought a matching (same power, same controls, same basic power train) 262 hp Model 280 Michigan *Tractor Dozer!*

Loads scale-weighed

The story of course doesn't end here. The next step was a series of jobs, ranging from the 60,000 yd state road subcontract pictured to a 700,000 yd housing project. On most, the Michigans worked alongside several other self-propelled scrapers. Contractor time studies showed a production advantage for the Michigan Scraper . . . though, because weight tests had never been made exactly, "how great" an advantage wasn't known. Then, one day, a leading competitor of ours brought in several time-study experts and a set of platform scales.

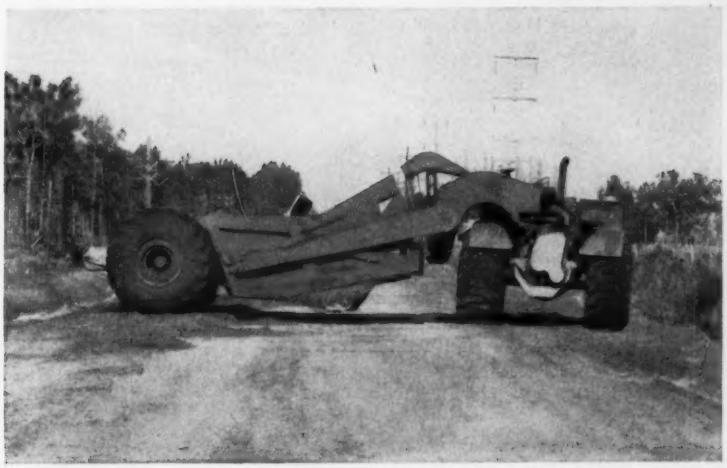
What they found sent them away shaking their heads.

For, the Michigan Model 210, weighed and timed over a lengthy period of time, had moved 77% *more dirt per day than its rivals!*

1/3 more pay yds per load

Weight studies, alone, showed a 33% advantage. Michigan loads in typical Florida sand *averaged 14 pay*

Cutting to final grade, the 262 hp Michigan has power to effectively self-load.



Power-steered, power-shifted Michigan turns around non-stop on 35 ft roadbed.

77%

yards. Self-propelled Scraper "A," with heaped capacity of 17 yards (compared to the Michigan's 19), *averaged 10½ pay yards.* Self-propelled Scraper "B," capacity also 17 yards, *averaged 10½ pay yards.* Same material, same cut, same pusher (the Michigan 280), *same load time* for all scrapers.

1/3 more trips per hour

Haul studies showed a similar advantage. Traveling over a hilly, winding mile-long 'round-trip, the Michigan made 10 cycles per hour. The other two scrapers each made 7 cycles per hour. Higher top speed—plus the exceptional time-saving advantages of power-shift transmission and torque converter—accounted for the difference.

This Clark power train combination had another major advantage too, according to Mr. Thomas. "We were working with inexperienced operators," he recalls, "yet we had no worries about ruined transmissions. Nor was there any lugging down nor any wasted time shifting, so the Michigan Scraper always moved at the maximum speeds possible." Top speed—31.4 mph.

Why not see what Michigan's loading ability, plus job-proved power train can do to speed dirtmoving *on your job.* Your Michigan distributor will be glad to demonstrate for you. *Your* operators can, if you wish, do the operating . . . *you* can make whatever time and weight studies you think necessary.

$4.50 per hour profit drain also eliminated

A year before Thomas' Michigan *Dozer* went to work, the company handled push-loading with a 40,000 lb class crawler. Did a fair job, but track replacement costs alone averaged $4.50 per hour. Every 500 to 600 hours, the crawler had to be pulled off the job and some 12 man-days invested in a track overhaul.

Then Mr. Thomas bought a rubber-tired tractor. Wasn't a Michigan, but it *did* end the track costs. Unfortunately, it also hurt production. This 30,000 lb machine just didn't have the necessary power, especially when turning under load. Thomas "tested" it for six months, then gave up and made a trade in November, 1958, for the 50,000 lb, 262 hp, Michigan Tractor Dozer.

Today, no more problem! Bigger, more powerful, faster on both pushing and dozing, the Michigan applies four-wheel drive at all times. Typical 14 pay yd scraper loads, in typical Florida sand or marl, take the Model 280 from 30 to 60 seconds. Tires, with the machine running year-around 10 hours a day, 5 days a week, still have almost all tread . . . are expected by company officials to last about 3 years (an estimate based on Thomas' experience with Scrapers). Power train, controls, many other parts are basically the same as on the Model 210 Scraper (also as in the Michigan 4½ yd Model 275 Tractor Shovel), hence maintenance and operator training are simplified, parts needs lower, push-loading efficiency higher than on "mixed" fleets.

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK EQUIPMENT

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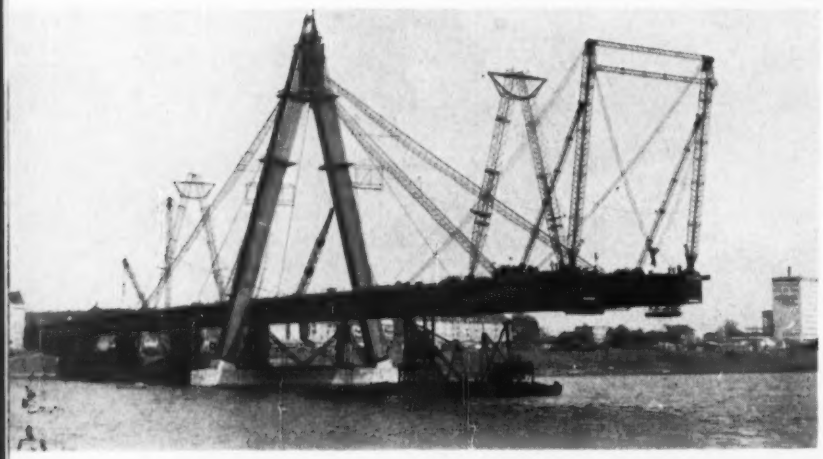
Construction 'Round the World . . .

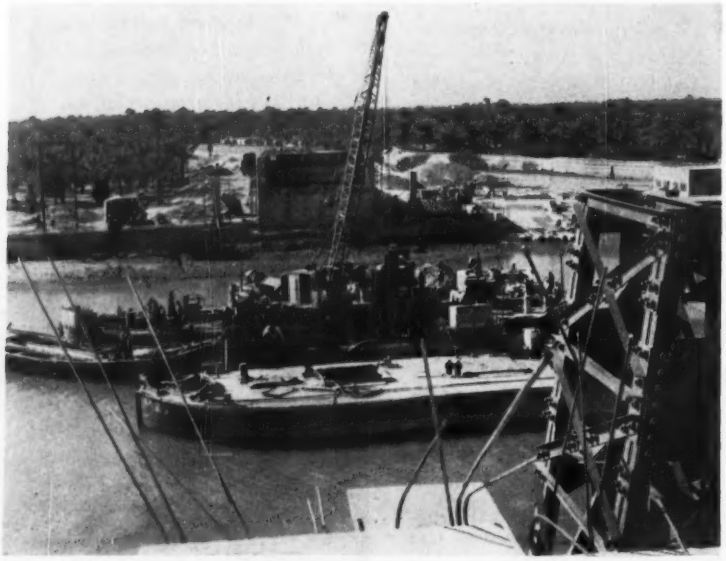


In West Germany

Suspension span of Severin Bridge cantilevers over the River Rhine at Cologne, West Germany. Bridge features an A-shaped steel tower 250 ft high from which six cables will fan out to carry the weight of the span. Lifting frame at end of cantilever lifts components into place. Bridge is 2,266 ft long.

In Great Britain

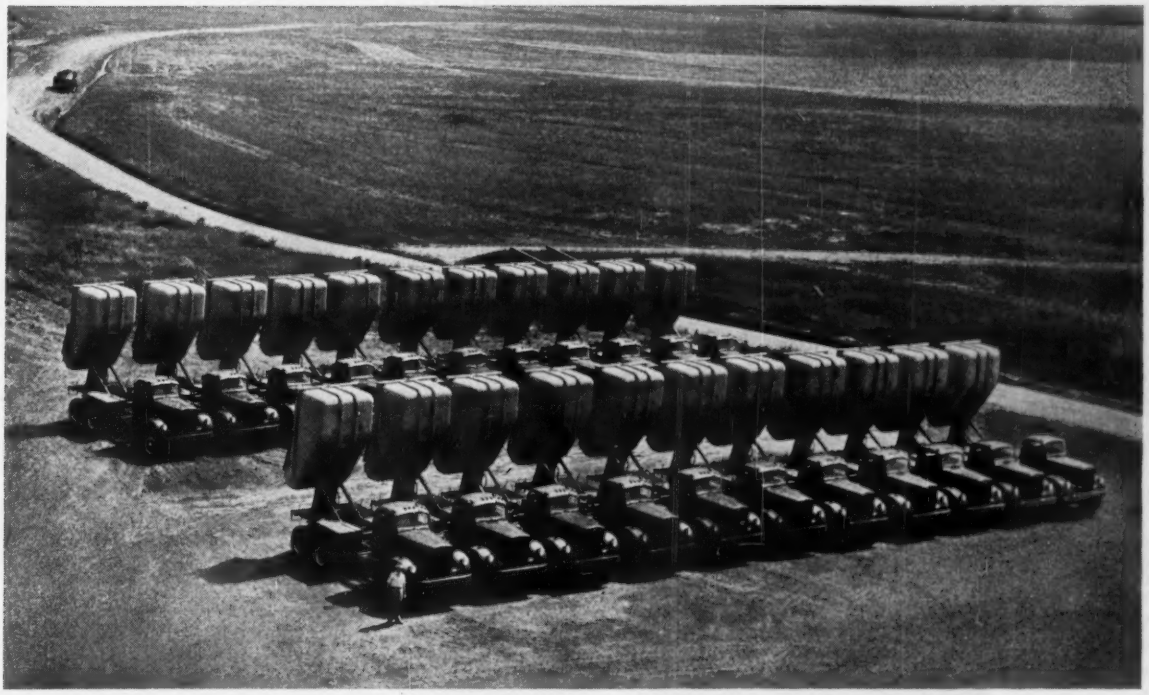
Barge-mounted crane dredges mud and clay from the approaches to completed quay at Southwick Shipyard in Sunderland, England. To build deepwater berths, 86,000 cu yd of material was removed and dumped at sea. Holloway Brothers, Ltd., of London is the contractor for the $4.2-million redevelopment, now nearing completion.



In Iran

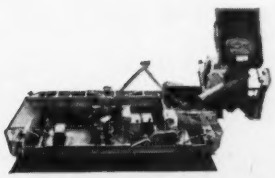
Crews construct the final pier for the Pahlavi Foundation Bridge across the River Karun, linking the island of Abadan and the port of Khorramshahr, Iran. The bridge, constructed of reinforced concrete and steel, will have five spans and will be about 2,000 ft long. The Cementation Co., Ltd., of London designed and built the bridge.

A major contractor speeds big concrete jobs with a fleet of Dumpcretes like this ...and so can you



You handle big yardages of concrete ... fast ... with Dumpcretes. Time and labor savings show up in a hurry on dams, reservoirs, power plants and similar mass concreting jobs. High discharge of Dumpcrete Body permits easy charging of concrete buckets, hoppers or conveyors. Dumpcretes are versatile, too ... when not used for concreting they'll haul earth, sand, aggregates—anything that flows! And Dumpcrete fleets, like the one shown above, really pay off on concrete paving projects!

The best way to get all the economies of the central-mixing, non-agitated hauling method on large or small paving jobs is to team Dumpcrete Bodies with Dumpcrete Spreaders. The fast, 90-seconds-from-truck-to-slab cycle of the Dumpcrete Spreader assures a high-production paving spread. And job efficiency improves because Dumpcretes reduce confusion at the paving site. Regardless of the total yardage handled, you can count on Dumpcretes and Dumpcrete Spreaders to cut your concrete placement costs.



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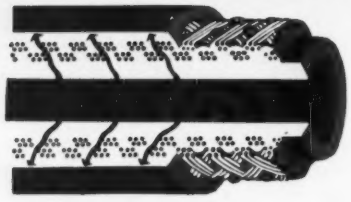

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Homoflex Air Hose is mandrel-made with *no* pre-set twist—it coils and uncoils freely in *any* direction *without* kinking! It's the easiest handling hose you can use with air drills. Exclusive Homoflex construction makes strength member and tube virtually inseparable, assures long, trouble-free service life. Uniform inside and outside diameters permit faster, easier, *safer* coupling . . . faster, fuller flow.

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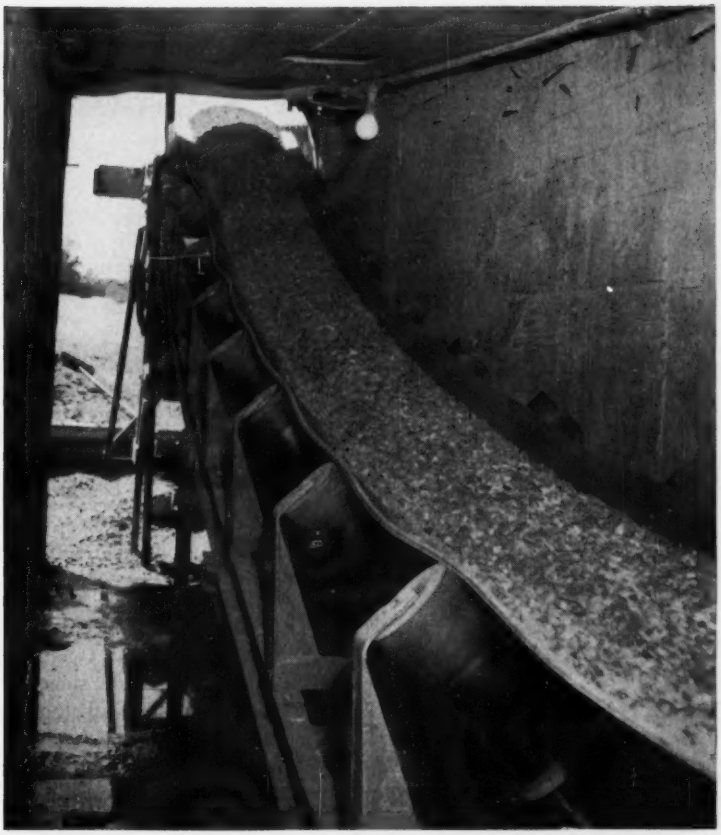

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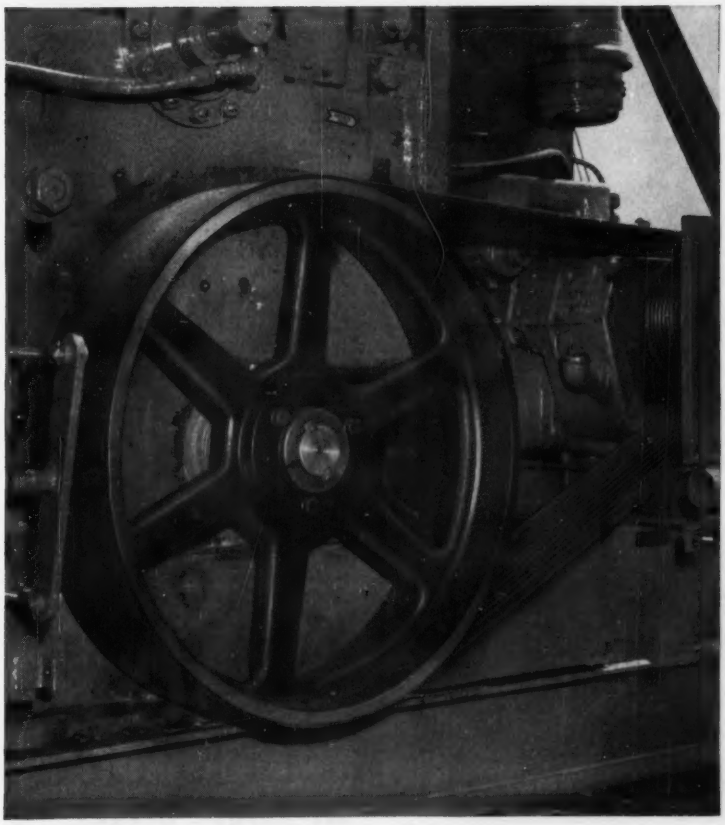

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Operators of heavy off-road vehicles are finding that Hi-Torque brakes boost their profits—and that's a feature to consider when choosing *your* heavy equipment.

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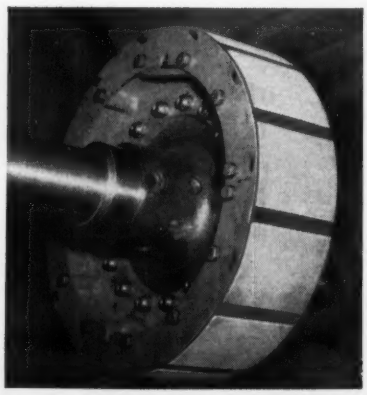
2-wheel tractor with Hi-Torque brakes



Full circle contact with drum is provided by Hi-Torque brakes giving maximum effective braking surface in the same size unit. Hi-Torque stops vehicles twice as fast as conventional brakes.

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Hi-Torque brakes

Construction Methods AND EQUIPMENT

MARCH, 1960

VOLUME 42 • NUMBER 3

HENRY T. PEREZ, Editor

Less Quibbling, More Cooperation

THE OBJECTIVE of every honest consulting engineer or architect is to design for the client the structure or facility that best suits his needs and can be built most economically. He also will see that the owner gets what he pays for.

The objective of the honest construction contractor is to build for the owner the best structure possible, consistent with the plans and specifications, and to build it within his bid price.

To achieve either of these objectives requires respect and understanding among the parties concerned. Engineers and constructors must cooperate if their mutual client, the owner, is to have his best interests served.

Many times, in an effort to conserve materials going into the finished structure, the engineer will come up with a design that is impracticable or uneconomical to build in the field. Is there any point in saving $1,000 worth of concrete, for example, if it requires extra-fancy formwork costing an additional $1,500?

Yet too often a contractor requesting a design change has been treated as though he'd asked for a license to steal. The same sometimes happens when he asks for changes caused by actual site conditions that turn out to be different from those expected when plans were drawn, bids taken, and the contract awarded.

Some agencies, notably the Corps of Engineer, have solved part of the problem by holding pre-bidding conferences. There, preliminary plans and procedures are discussed, prospective bidders' questions are answered, and points of possible later contention are clarified. If more of those who award contracts and supervise construction would do likewise, it would eliminate many of the frictions that plague engineer, contractor, and owner alike.

Another area where greater engineer-contractor cooperation can be improved is field direction. Engineers complain that contracting outfits often assign too few well-qualified supervisors to the job. Contractors counter with the claim that it's the engineer's field force that causes the trouble. Lack of knowledge and experience, they say, often leads the resident engineer to insist blindly that the plans and specifications be followed to the letter, even though a better job would result from a contractor-suggested alternate.

And even when the resident is in favor of a change, he often is not allowed to make the decision but must go through the time-consuming and job-delaying process of getting approval from the main office. It's been said, only half jokingly, that the only authority given the field man is the authority to make things tough for the contractor.

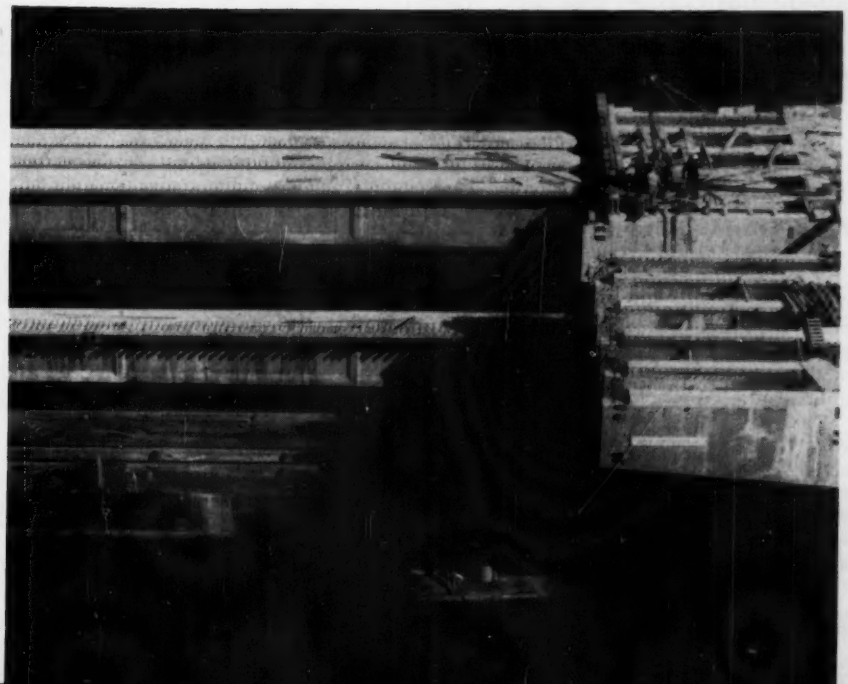
William Denny, executive vice president of Merritt-Chapman & Scott Corp., touched on the engineer-contractor relationship when he accepted The Moles Award last month for outstanding achievement in construction. *"Contractors and engineers,"* he said, *"must always deal at arm's length, no matter how close their mutual objective—but arm's length does not mean sword's length. My experience is that the construction dollar produces the most when the degree of cooperation between them is the greatest."*

TWIN SPANS—Bridge is two parallel structures, each consisting of six 147-ft-long cantilever girders at each end and five 231-ft-long drop-in girders that fit between the cantilevers to complete the 320-ft center span. Total length of the bridge is 460 ft.

DROP-INS—Jacks mounted on top of the cantilever girders lift 222-ton drop-in girders into place from a barge. The drop-in girders are T-shaped with 8-ft-wide flanges and 11-in.-thick webs except for 27-ft-long I-beam finger sections at the ends.

Girders Move From Casting Yard Into Position On Roller Carriages

To erect the 240-ton cantilever girders for the longest prestressed bridge ever built in this country, the contractor moved them from the casting yard to final position in the bridge on a pair of steel beam carriages riding on express rollers. Jacks pushed the girders along channel runways across a temporary bridge from bank to pier. Then crews rotated the rollers 90 deg and shifted the girders transversely into span position. A barge delivered the drop-in girders for the center span, and jacks lifted them into place between the jutting fingers of the cantilever girders to complete erection.



"NOW THAT BUILDING prestressed concrete bridges has become quite common, some contractors are saying there's nothing to it," says Bill Mayhew of Terry Contracting Co. "But let me tell you, that's not the case with the bridge we're putting in across Oneida Lake in upper New York State.

"It will be the longest prestressed bridge span in this country. And building it required more engineering than many projects call for in the design stage.

"To move the 240-ton concrete girders that make up the cantilever spans from the casting yard to final position in the bridge, we had to devise a carriage on which the huge units roll along channel runways. And we had to build a temporary steel bridge spanning between abutment and pier to carry the girder-supporting carriages across the 70-ft gap."

That's the way Mayhew, chief engineer of the Long Island City, N. Y., construction outfit, introduces you to the 460-ft-long bridge that will carry the Empire Stateway across a narrow arm of Oneida Lake just east of Brewerton. It's Terry's first concrete bridge job, but for years they have specialized in difficult steel erection jobs, so they're used to handling unusual problems.

Twins Are Twice as Tough

The bridge is actually two identical parallel structures. Each consists of two cantilever spans and a suspended center span. At each end, six 147-ft-long post-tensioned girders, connected by concrete diaphragms and anchored by a massive concrete counterweight, span 70 ft between abutment and pier. And they jut 72 ft beyond the pier over the navigable channel that the bridge spans. Five 231-ft-long drop-in girders fit like fingers between the ends of the cantilever girders to form the 320-ft center span.

Each of the 240-ton cantilever girders is 13½ ft deep between abutment and pier. They taper to 8½ ft from the pier to the outer end. The interior girders are shaped like I-beams with 4-ft-wide flanges and an 11-in.-thick web. The exterior girders are rectangular so they will present an architecturally pleasing smooth face on the outside. Hollow cardboard Sonovoid tubes are cast in them.

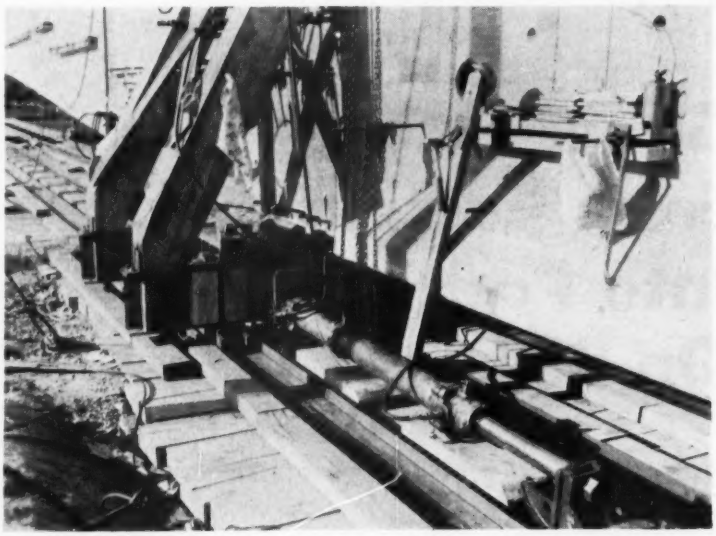
continued on next page

Jacks Push Roller Carriages

The five drop-in girders for the center span of each structure are T-shaped, except for 27½-ft-long I-beam finger sections at each end that fit between the cantilever girders. They measure 8 ft across the top flange, 23 in. across the bottom flange, and 11 in. through the web. They vary in height from 8 to 8½ ft. Each weighs about 222 tons.

Terry built the cantilever girders in 160x200-ft concrete-paved casting yards located directly behind the abutments on each side. Then they rolled them into final position along channel runways over a temporary bridge spanning between abutment and pier.

They cast the drop-in girders in another yard just east of the pair of abutments on the north side. These girders they rolled one at a time onto a barge that floated them into position beneath the center span. Jacks on top of the cantilever girders were connected to yokes slung underneath the drop-in girders. The jacks lifted the drop-in girders off the barge and placed them between ends of cantilevers.



DOWN THE RUNWAYS—Pair of jacks powered by an Elgood hydraulic pump system mounted on side of girder buck against wood blocks held between channel runways by clips.

So the Job Rolls

Moving the huge cantilever girders from casting yard to position between abutment and pier tested Terry's skill more than any other phase of the job. To accomplish the move they devised a carriage assembly of steel beams carried by express rollers.

Terry built two pairs of carriages. Each pair consists of a large frame that seats the pier bearing area of the girder on eight sets of express rollers and a smaller carriage that supports the abutment end of the girder. This smaller carriage rolls on only four sets of express rollers.

Each express roller consists of an endless chain of 16 roller pins, each slightly less than 2 in. in dia, mounted within a 7½x21-in. steel frame. Each 5-in.-high unit weighs 132 lb. Supplied by the Industrial East Co., of Clifton, N. J., the express rollers have a capacity of about 150 tons each.

In the larger carriages, parallel 14BP117 beams extend transversely beneath the girder and transmit its weight to a 5-ft-long longitudinal 14BP117 beam at each end. Connected at right angles to each end of these longitudinals is a 14WF53 section with a set of express rollers under either end. Longitudinal and right-angle beams are mounted on shafts, so the undercarriage can rotate in two directions. This lets the eight express rollers conform to irregularities in the tracks on which they ride—four lines of 12-in. 30-lb steel channel sections laid web down.

The express rollers are not attached to the carriage. They are separated from it by a wood shim that crunches into the corrugated top surface of the roller frame under the weight of the girder. With all load removed, the rollers can either be oriented to roll the girder longitudinally or turned to move it transversely.

Jacks Provide Muscle

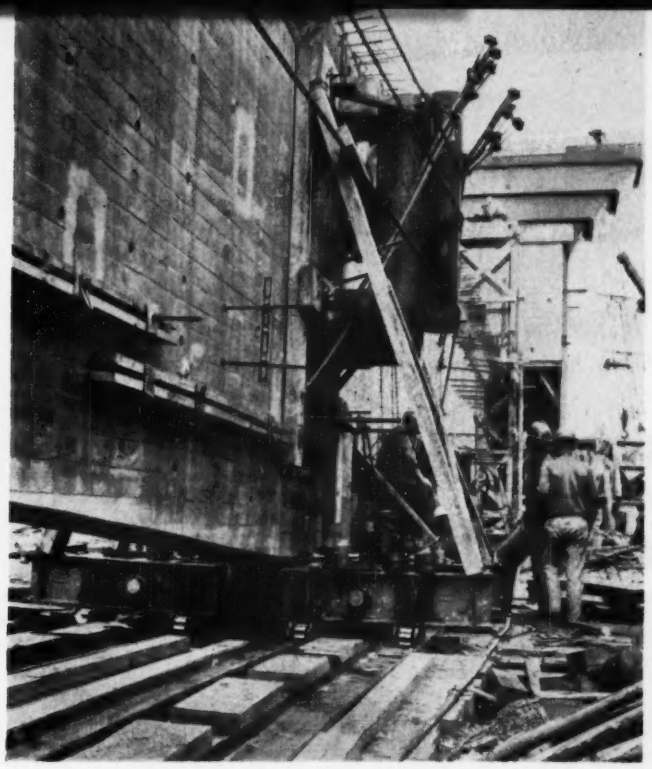
An Elgood hydraulic pump system mounted on the side of the girder powers two jacks that push the huge units along the channel runways. The jacks are mounted on the carriage frame under the pier bearing area.

The jack rams push against wood blocks set between the channel runways for the express rollers and held by steel clips welded to the flanges. The blocks are spaced at 5 ft to match the stroke of the jacks. The express rollers turn with so little friction that a jacking force of 10 tons is sufficient to move a girder at an average of about 25 ft per hr.

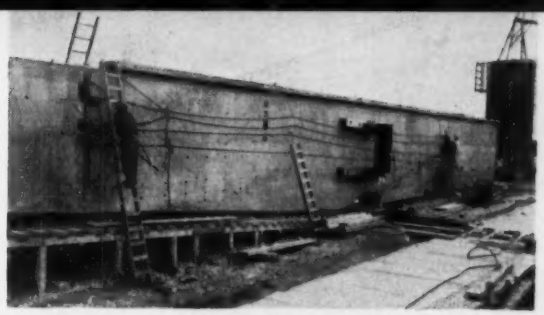
The rollers beneath the forward carriage take most of the weight of the girder during movement. Terry estimates that the forward carriage carries 210 tons of the total 240-ton load. The abutment end tends to slew back and forth on its carriage, but a couple of men with pry bars steer it into line with little difficulty.

Terry devised a sway-bracing system to minimize bending of the long beams. It's a king-post truss mounted at each side of a girder over the forward carriage. A triangular steel frame holds a vertical 10-in.-dia pipe about 4 ft out from the side of the girder. Four strands of ⅞-in. wire rope, stretched tightly over the pipe by turnbuckles, extend 25 ft and 35 ft beyond the pipe on either side and are anchored to inserts in the girder side.

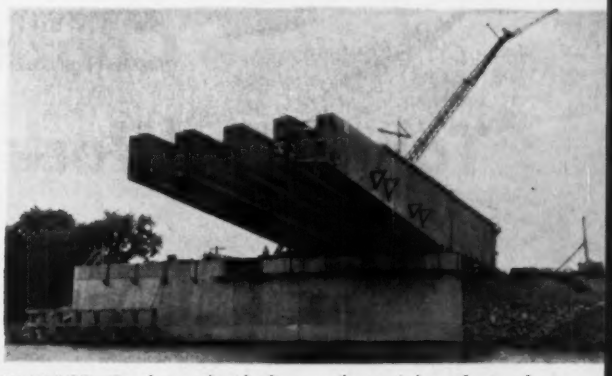
Terry built a temporary bridge to carry the cantilever girders across the 70-ft gap between abutment and pier. The bridge consists of four 36WF300 beams connected by 12-in. channel diaphragms and topped by 12-in. channel runways welded to the cover plate on the top flange. Runway spacing matches that of the



CARRIAGE ROLLS SMOOTHLY—Rollers turn so easily that a 10-ton push is enough to move huge girder at a rate of 25 ft per hr.



SWAY BRACING—Workmen place four strands of 7/8 in. wire rope over king-post truss to help keep long timber girders in line.



IN PLACE—On the north side five cantilever girders of one of the twin structures jut out from pier 72 ft over navigable channel.

carriage runways in the casting yard.

To place one of the cantilever girders, Terry first lifts it up from the soffit form with four 100-ton jacks. Lowered onto its carriages, the unit is rolled sideways until it aligns with the channel runways leading to the temporary bridge. Jacks again raise the girder so the supporting express rollers can be turned 90 deg. Then the two jacks on the girder push it longitudinally through the yard and over the temporary bridge.

When the girder has been pushed out the correct distance, two 200-ton jacks raise it so the express rollers again can be rotated 90 deg. Now they ride runways atop pier and abutment and carry the girder sideways to its final location. One last jacking allows removal of carriages and rollers.

When all six cantilever girders at each end of one of the parallel structures has been erected, Terry barges in the five drop-in girders one at a time and lifts them into span position. A pair of hydraulic jacks at each end handle this operation. Mounted over the gap between the ends of the cantilever girders, they pull up on two threaded rods. At the bottom of each threaded rod, a clevis hook connects to a steel-beam yoke that fits beneath the ends of the drop-in girders.

Terry completed erection of all girders last year. Now the work remaining consists of pouring and stressing the diaphragms, completing the massive counterweight, and pouring the deck slab. But a full year of preparatory work preceded last year's activity.

Setting Up

Terry started the job in 1958. It took them almost a year to erect a batch plant, prepare the casting yard, build the forms for the girders, and plan all the details for moving the girders.

Specs require that all girders in each structure be cast during the same season to minimize the effect of differential shrinkage. They started pouring last spring and completed casting all girders by the end of the season. It took about nine days on the average to form and reinforce one of the cantilever girders; drop-in girders took only six days.

Terry constructed two sets of forms for the 16 I-shaped interior cantilever girders, two sets for the 10 drop-in girders, and one set for the eight exterior cantilever girders.

Pouring each girder took about 6½ hours on the average. A contractor-built batch plant equipped with two Worthington mixers supplied concrete. A Koehring truck crane, working with as many as three 1-yd laydown buckets, placed it. Specs limited the concrete drop to 4½ ft, so Terry set up a battery of 14 concrete hoppers on towers along the girder to be poured. Through elephant trunks, these deposited concrete in ports cut into the side of the girder forms.

Both cantilever and drop-in girders required about 110 yd of concrete. To keep the mass of concrete plastic long enough so the entire member could be cast without cold joints, Plastiment was added to the 7¾-sack mix. This resulted in early strength gain—to 4,000 psi in four days.

After casting and curing but before erection, the girders were partially post-tensioned by the BBRV system, as supplied by Ryerson. Second stage stressing of the cantilevers followed erection, before the drop-in girders were lifted into place.

Terry expects to complete the $2-million job this spring, according to Chief Engineer Bill Mayhew. Lloyd Monroe is superintendent at the site for Terry.

Edward Olchewski is resident engineer for the New York State Department of Highways. Design engineer for the unusual structure is Summers, Munninger & Molke of Albany, N. Y.

An imaginative contractor, Harry Worsham, likes to put machines to work handling concrete forms. If he can't buy the right rig, he invents one.

Contractor's Inventions Take the Work out of Formwork

A HALF DOZEN ingenious devices, designed and built by the contractor, simplify form handling for the erection of a three-story warehouse in West Haven, Conn. Worsham Construction, Inc., of Denver, Colo., holds the $3.5-million contract.

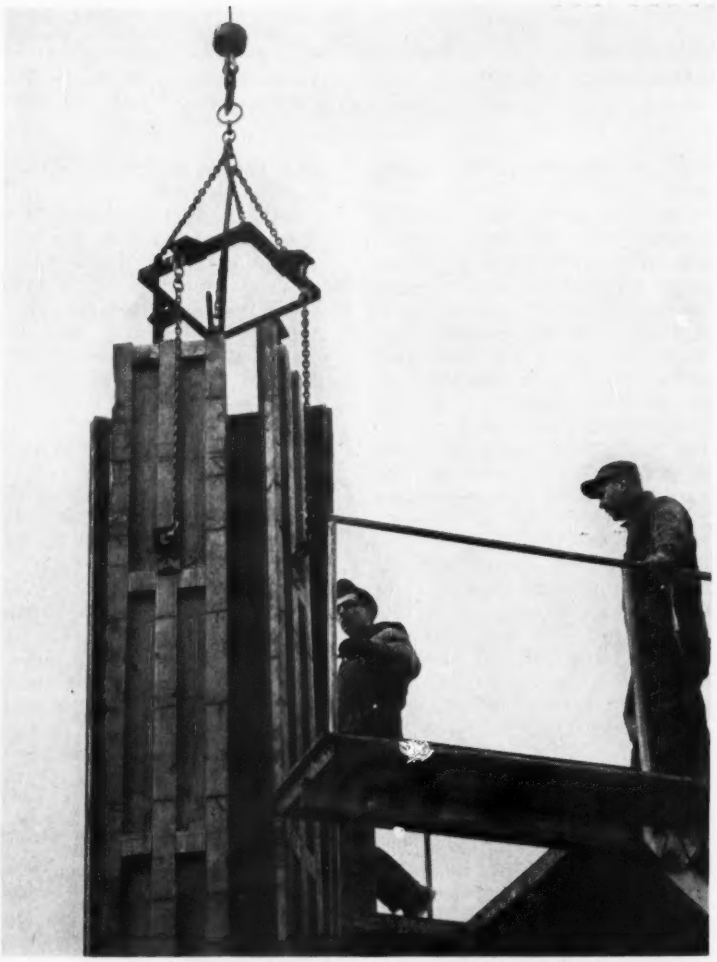
Each of the three floors covers 250,000 sq ft. Ceiling height is 23 ft; the columns are spaced at 23 ft also. The contractor is forming and pouring the floors in 50,000-sq ft sections.

Floor forms, built of ¾-in. plywood on 2x4 joists, are pre-assembled into panels as big as 18x18 ft. Waco heavy duty scaffold frames support the forms. The form-scaffold assemblies are moved as a unit. This system, together with the other contractor-designed devices, permits a small crew to form as much as 15 bays per day.

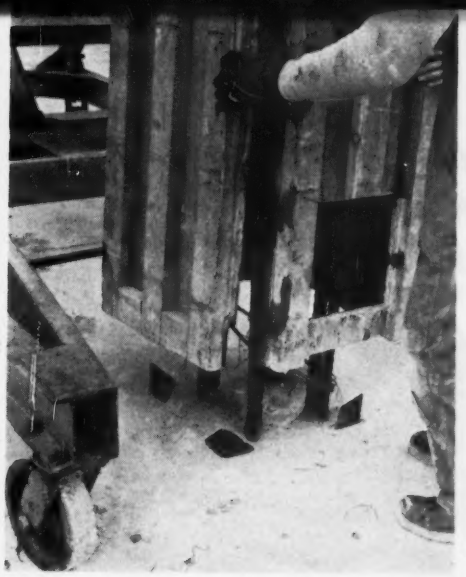
The Worsham inventions include corner irons for quick and exact positioning of column forms and special handling brackets for lifting these forms into place. An elevating scaffold that works on the principle of the scissors jack comes in handy as a work platform in erecting the column forms.

Specially designed dollies, riding on airplane wheels, carry and position the floor forms together with the scaffolds that support them. To lift the scaffolds during forming and lower them for stripping, Worsham designed and built special hydraulic jacks.

Once the forms are in place, a three-man surveying crew adjusts



LIFTING BRACKET—A square bracket with four chains handles all four panels for a column form at the same time. The forms are laid flat on the ground, and the chains are hooked to them near the tops. A crane lifts the forms into position, and column clamps lock them together.



CORNER IRONS—Four brackets are located by surveyors on the floor slab. Column forms fit around the four brackets.

Special Devices Lift and Position Column Forms

the elevations with the help of a leveling instrument and two-way radios.

To secure the form sections to each other, a special clamp was designed. It is made of spring steel and looks like a stirrup.

All of the devices were built by the contractor's own men—the lifting rigs were assembled in Denver, but the dollies and the stirrup clamps were made at the job site. Mike Raino, Worsham's master mechanic in West Haven, handles the mechanical work on the job.

Corner Irons

Small iron brackets, similar to the protective metal corners on trunks, simplify the positioning of column forms. A surveying crew exactly locates one of these irons for each corner of a column. The irons are permanently attached to the floor slab by explosively driven stud nails.

Four form sections for columns, which are 23 ft high, are then raised and positioned against the outside of the corner irons. Column clamps lock the forms into place. When the column is poured, these corner irons remain in the concrete and protect the corners of the column. The irons are stamped from 16-gage sheet metal.

Lifting Brackets

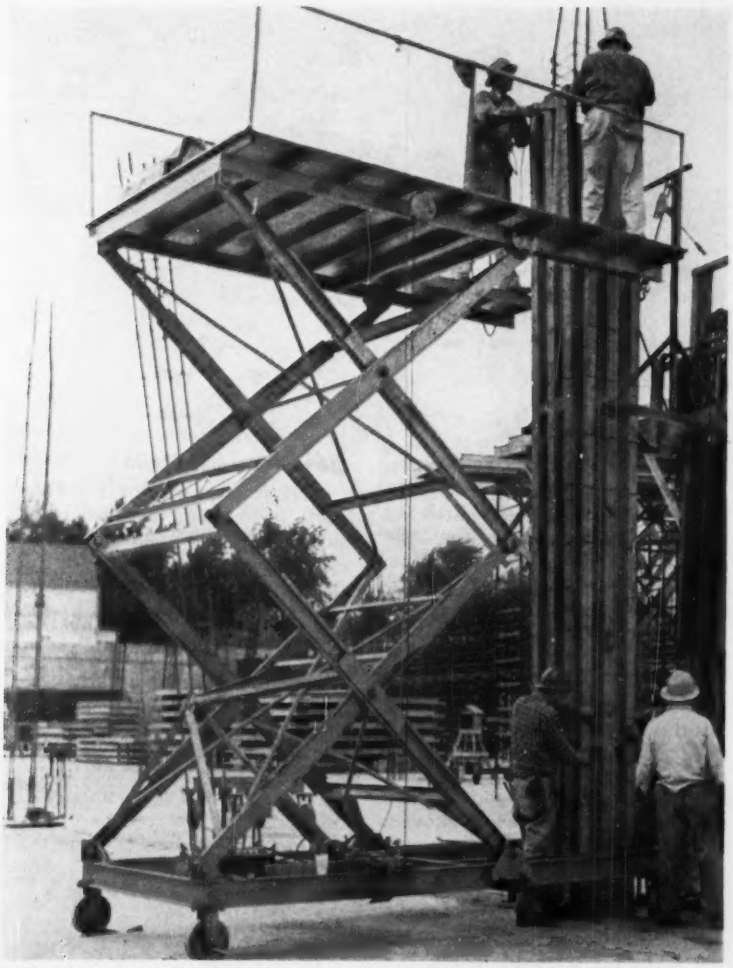
All four sections of a column form are put in place at the same time. A Pitman hydraulic crane handles a square lifting bracket with four chains—one for each form section. The wood forms are laid flat on the ground, and a shackle at the end of each chain is hooked to a metal bracket near the top of each form section. After the forms are raised, all it takes is a few column clamps to lock them together. The column capital form goes into place after the floor above the columns is formed.

Elevating Scaffold

Hydraulic pumps, salvaged from government surplus airplane parts, operate a scissors jack arrangement that raises and lowers a work platform. One end of the platform is U-shaped to fit around a column and provide working areas on three sides of the column.

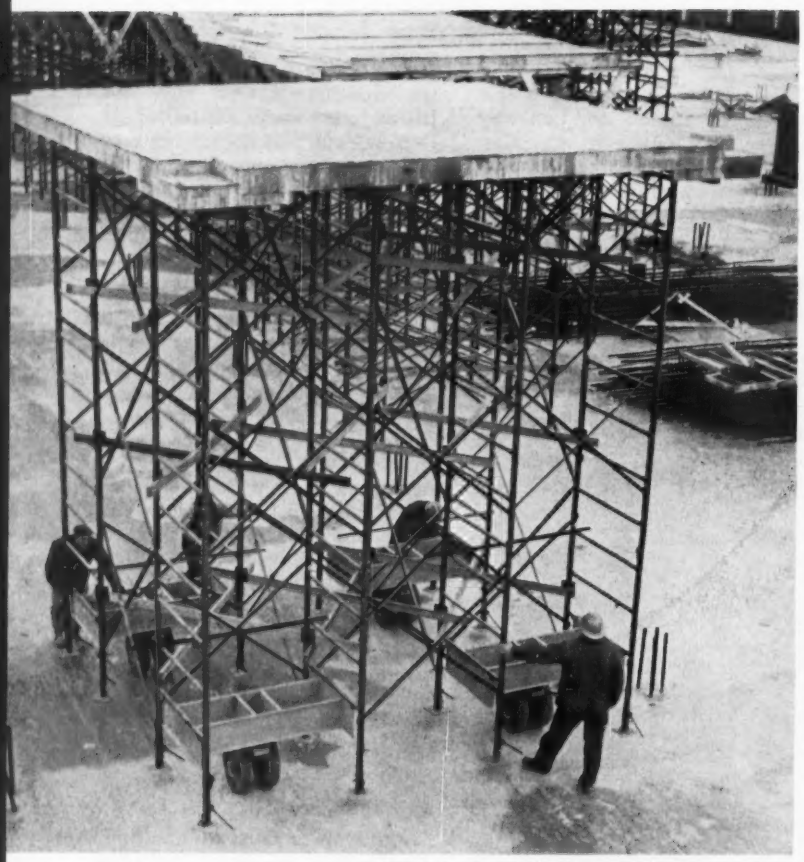
Two 12-volt storage batteries, connected in series to give 24 volts, power a 600-psi Bendix hydraulic pump that activates the elevating mechanism. The platform elevation can be controlled both from the scaffold top and from the ground. The rig moves on four casters.

continued on next page



ELEVATING SCAFFOLD—A scissors jack arrangement, powered by a surplus airplane hydraulic pump, raises and lowers a work platform. One end fits around a column to provide working areas on three sides. Platform elevation can be controlled from the ground or from the platform.

Airplane Wheels Move the Forms, Jacks Raise Them



MOVING—Four dollies fit under the horizontal struts of the Waco scaffold frames and carry the form for an 18x18-ft section of the floor slab. Each dolly rides on two airplane wheels that pivot about a vertical axis to change direction when moving.

POSITIONING—Still riding on the dollies, the scaffolds are positioned as correctly as possible to avoid moving them once they stand on the floor. To lower the forms, hydraulic jacks lift the dollies and scaffolds, the scaffold legs are extended, and the dolly is lowered to the floor to be moved away.

CONTRACTOR'S INVENTIONS . . . *continued*

Moving Dollies

After columns are formed, floor forms and their supporting Waco scaffolding are moved into position. Sets of dollies that ride on airplane wheels fit under horizontal struts of the heavy duty scaffolds to carry the assembly.

The floor forms are panels of ¾-in. plywood on 2x4 joists. They are preassembled in three different sizes: 18x18-ft units cover the center portion of each bay; 5x18-ft panels fit between the columns; and 9x18-ft panels work in odd places, such as around elevator shafts and stairways.

Lifting Jacks

Battery-powered hydraulic jacks lift the scaffold-form assemblies onto the dollies and lower them in the proper position. Two 12-volt storage batteries supply 24-volt current to the 600-psi hydraulic pump. All of the hydraulic pumps, including those on the elevating scaffolding, are identical and interchangeable. The batteries are recharged at the end of each working day.

Each jack rides on four casters attached to the ends of steel strips that act as springs. When there is no load on the jack, the steel strips lift the base of the jack off the floor so the rig can be moved about. When a load is being raised, the strips deflect, lowering the base of the jack to the floor for better support.

The casters on the jacks and the elevating scaffolds are quite small. To make it easy for them to move about, Worsham crews periodically sweep the floors with a Wayne power sweeper.

Elevations by Radio

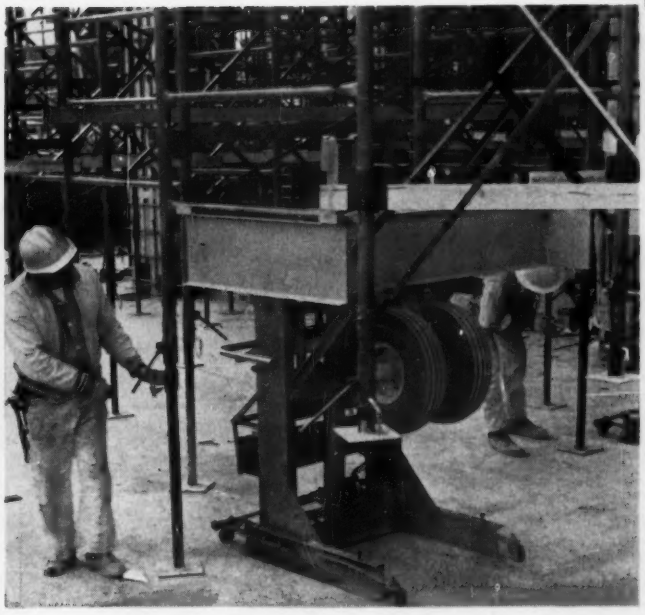
Once the forms for a 50,000-sq-ft section are in position, the surveying crew makes the final elevation adjustments. The instrument man and the rod man are on the top of the forms; a third man is below to handle the adjustable legs on the scaffold frames.

The instrument man remains in one place; the rod man moves from panel to panel while the man handling the scaffold legs makes elevation adjustments directly below the rod man. Both the instrument man and the man adjusting the scaffolds have Vocaline two-way radio sets.

Stirrup Clamps

Form panels are secured to each other with U-shaped clips made of spring steel. Each clip slides over the two 2x4's on the edges of adjacent form panels and locks

STIRRUP CLAMP—A U-shaped clamp made of spring steel slides over the two 2x4's on the edges of adjacent form panels and locks the panels together into a rigid framework.



TWO-WAY RADIO— The instrument man on top of the forms gives instructions by radio to a man, also with radio, who is adjusting scaffold legs directly below the rod man.

the panels together into a rigid framework.

The U-clips are easy to install and remove. Forming and stripping go much faster than they would if the panels had to be nailed together.

Column Capitals

After all slab forms are adjusted to proper elevation and locked together, the crews position the forms for the column capitals. First, the position of the column form is adjusted. The base is already in its exact location; all that is necessary is to plumb the column.

The form for the capital fits directly on top of the column form and gives it lateral support. The capital form can be adjusted to fill the opening between the floor forms around the column. The forms are coated with a mixture of Knoxcrete and diesel fuel for easier stripping.

Column reinforcing is tied together on the ground and put in place before the column forms are erected, but steel for the floor slab is tied in place.

The columns are poured first and the floor slab last. A hopper on a materials tower lifts the concrete to each floor, and concrete buggies place it for the slab. The crews are pouring about 6,000 sq ft of floor per day.

Stripping starts after four to seven days, depending on the temperature. The jacks lower the forms, and the dollies move them to their next location.

Men on the Job

The building was designed by Worsham Construction, Inc. Their architect is Jack C. Hupfer, and their structural engineer is Sydney Flook. Edwin "Bud" W. Wehrer is the superintendent; Floyd Johnson is assistant superintendent.

COLUMN CAPITALS—Forms for the capitals go in last. First the column is plumbed, then the capital form is put in place. It gives lateral support to the column form.

New Cofferdam Sealing Technique

Rig above, on bridge spanning excavated but not dewatered cofferdam, sets and grouts anchor bars into underlying rock to hold down 4-ft tremie seal slab. A conventional seal without anchors would have to be as thick as 28 ft.

THE TREMIE CONCRETE SLAB that seals the floor of a cofferdam for a vehicular tunnel in Florida is just 4 ft thick. That's only one-seventh the maximum thickness that ordinarily would be required to counterbalance hydrostatic uplift with a conventional gravity-type tremie seal. What's the secret? It's ingenious replacement of sheer mass by anchorage of the thin slab to underlying bedrock with grouted bars. The neat scheme not only saves a vast volume of concrete but eliminates a like amount of excavation and simplifies cofferdam construction.

Thorington Construction Co. devised the procedure for a cut-and-cover tunnel under the New River in Ft. Lauderdale. At the deepest point, the tunnel floor is 50 ft below water level.

Material at the site is highly porous limerock with some sand and coral. This calls for a steel sheet-pile cofferdam. And because a 40-ft-wide navigation channel must be maintained in

Saves Excavation and Concrete

the river, cofferdamming is a two-stage job. When approximately half the tunnel length is built, the first-stage cofferdam is removed, the river diverted over the completed section, and the second-stage cofferdam installed to build the rest of the tunnel.

For the cofferdam, Thorington rented some 2,800 tons of MZ-38 sheeting from L. B. Foster Co. Foster scheduled delivery so there was always an ample supply on hand in the required lengths—20 to 71 ft.

To spot the sheeting easily for correct driving, Thorington devised an adjustable templet. A two-story welded steel assembly, the templet is 28 ft high and 40 ft long to accommodate more than 25 sheets of piling.

At two levels, one at the top and the other near the ground, the templet is fitted with a set of transverse sliding beams. At the outboard end, each set of beams carries a longitudinal wale to guide the sheeting. Here's how the device works:

A crane spots the templet in approximate position—that's the beauty of this device: There's no time wasted lining it up exactly. Then men slide out the guide-wale assemblies to butt against a previously driven sheet pile. Next they adjust the other ends of the wales until they're "right on the money." And finally they lock the wale-carrying beams to the frame with ¾-in. pins.

Three Manitowoc cranes teamed up to drive sheeting. One handled the templet and threaded the piles. The other two drove the sheets home with McKiernan-Terry 10-B-3 hammers.

The team worked fast. In just 90 days it drove all of the 2,000 tons of sheeting for the first-stage cofferdam, whose wall measures 1,800 lin ft.

Thorington pushed the job into high gear with a smart cofferdam trick. The idea was to get part of the area dewatered as soon as possible. Excavating and sealing the entire first-stage cofferdam figured to take too long. So they split the area in two by driving a sheet pile diaphragm across it. Thus tunnel construction could begin in the shallower section while crews still were excavating and dewatering the rest of the cofferdam.

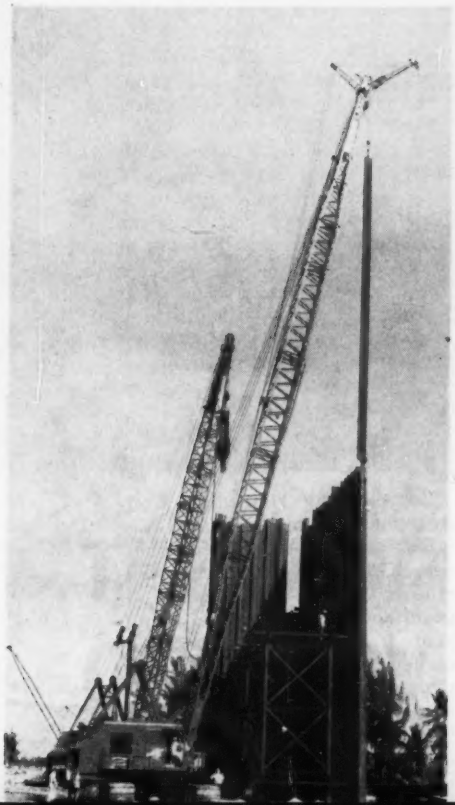
First-stage cofferdam excavation totaled some 80,000 cu yd of rock and sand. Draglines dug most of it. But when the cut was 20 to 26 ft deep, sheeting started to deflect. Then Thorington installed a one to three-level prefabricated bracing system.

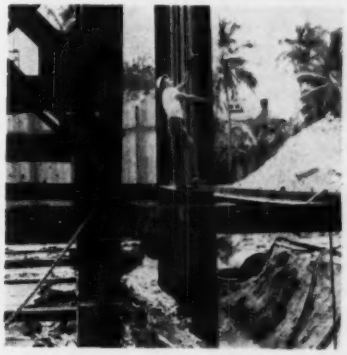
Once the braces were in, excavation became a teaspoon operation: The cranes had to switch to clamshell buckets to get between braces and close to walls. Carefully controlled blasting loosened lenses of tough coral for easier removal. And air lifts made of 7, 8, and 14-in. pipe, fed by a bank of Ingersoll-Rand compressors, made quick work of rock and silt clean-up.

Installing Anchors

While excavating to grade, Thorington prepared to install the anchor bars that were to hold down the tremie seal. Basically, the procedure is fast and efficient: From a traveling bridge spanning the cofferdam, (1) drive a 7-in. pipe casing, its end closed by an expendable tip, into the limerock, (2) tremie grout into it, (3) insert a No. 11 deformed reinforcing bar, (4) pull the casing, and (5) move to a new location and repeat the procedure. Upon completion, proof-test each bar by applying a measured pull, then tremie the 4-ft seal slab around the anchors.

For this work, Thorington built a bridge 18 ft wide and spanning 80 ft. Its double-flanged wheels ride on lengthwise rails on either side of the cofferdam. On its deck, 23 ft above the top of the rails, is a pile-driving rig with 90-ft leads. It, too, is rail mounted, and a Chicago Pneumatic tugger hoist spots it in position. Air for the tugger, and for a 9-B-3 hammer that drives the casing, comes from a 600-cfm compressor on the rig. The pile-





Templet Holds Cofferdam Piles

JOB-BUILT—Steel frame 28 ft high and 40 ft long holds some 25 sticks of MZ-38 sheet piling. Templet frame needs only to be set in approximate position because guide wales on front, carried by sliding transverse beams, are adjustable to exact line. L. B. Foster Co. supplied 2,800 tons of rental sheeting for job.

PILE DRIVER SETS ANCHORS—Rig first drives 7-in. pipe casing whose end is closed by expendable tip. Then it tremies grout, inserts No. 11 anchor bar, and pulls casing.

TESTING RIG HANDLES TREMIE—Originally set up to proof-test grouted anchor bars by exerting 65,000-lb pull. A-frame derrick holds pipe for pouring tremie seal slab.

NEW COFFERDAM SEALING TECHNIQUE . . . *continued*

driver carriage also carries a Clyde three-drum hoist that handles hammer, casing, and anchor bars.

Thorington wanted each anchor bar to take equal uplift when the cofferdam was unwatered. So, after careful analysis of underlying rock conditions and expected hydrostatic head, they drew up a schedule calling for 2,500 bars spaced 3½ to 10 ft apart and from 20 to 72 ft long. Because the bars are embedded for the full depth of the tremie seal, this meant the casing had to be driven from 16 to 68 ft into limerock.

After it was fitted with an expendable driving point to exclude mud and sand, the casing was spotted and driven home. Then a measured quantity of grout, depending on casing penetration, was tremied into the casing through a 1-in. pipe needle.

Anchor Bars

After removal of the grout needle, the readied anchor bar was inserted. To center the bar in the casing, its lower end was fitted with a welded ring, and to its third-points were welded stubs of reinforcing crossed at right angles. Welded 1 ft down from the top of the bar were two sets of fish-tail plates to increase its holding power in the tremie concrete. Each set consisted of four 2-in. 45-deg triangles of 1-in.-thick steel welded vertically at the quadrant points of the bar.

With the anchor bar inserted, the casing was slowly withdrawn. At the same time, water was hosed into the top. This kept a hydrostatic head on the grout to prevent its displacement by water flowing through the rock and into the space left by the casing shell.

After a suitable curing period each anchor bar was tested to a uniform 65,000-lb uplift, far above the design load of 46,800 lb. For this, Thorington built another rolling bridge riding the same rails as the bar-setting span. An A-frame derrick powered by a war-surplus LST anchor winch rides rails on the 16-ft-wde bridge deck. This applies pulling force through a two-part, 1½-in. wire-rope line attached by diver to the anchor bar by a set of grab jaws. A dynamometer inset in the two-part line measures the load on the bar.

Tremie Concrete

Thorington found the bar-testing apparatus handy for pouring the seal slab, too. The derrick handled a tremie pipe. Later Thorington added a second derrick to the bridge just for this purpose.

The 4-ft-thick seal was tremied in pours 65 to 70 ft long that could be handled comfortably in one 10-hr shift. For efficient pouring, about ½ lb of Pozzolith No. 8 set retarder was added to the 9-in.-slump mix, which reached a 5,000-psi strength in 28 days. Bulkhead forms were 2-in. timber sheeting bolted to a steel frame. Four 6-in. pipe spuds driven into the rock held them in place.

Thorington's anchored, thin tremie slab worked beautifully. After two Fairbanks-Morse 16-in. pumps unwatered the hole, there were no signs of a blow or of any structural weakness due to the novel design and work could proceed on the tunnel itself.

Representing Thorington Construction Co., Inc., Richmond, Va., is James E. Hood, project manager; George Poland, project engineer; and Harold Guppy, superintendent. Engineers are Singstad & Baille, New York. The owner is the Florida State Road department.

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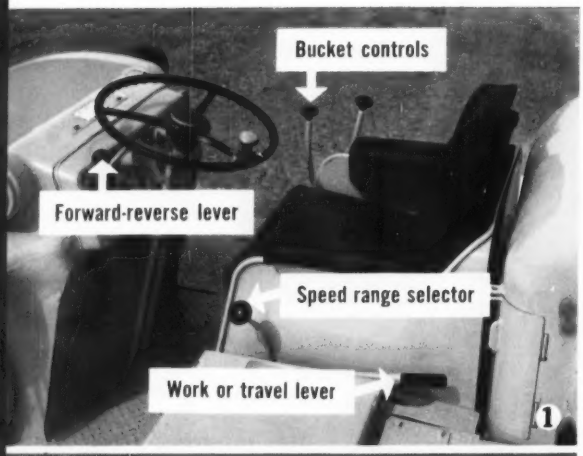

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The *right* brake leaves the transmission engaged . . . for full control when creeping, working on steep slopes or roading downhill.

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Horsepower (Net)	105*
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(with gasoline engine)	20,440 lb.

* For comparative purposes, the maximum rating of the D330 Engine used in the No. 944 is 135 horsepower.

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Unusual features marked both predrainage operations at this large wet site. On the first job, the dewatering scheme permitted construction of a cofferdam 30 ft below Jamaica Bay – without cross-bracing.

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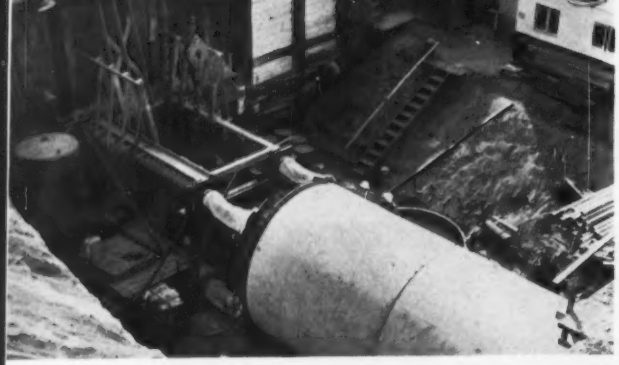
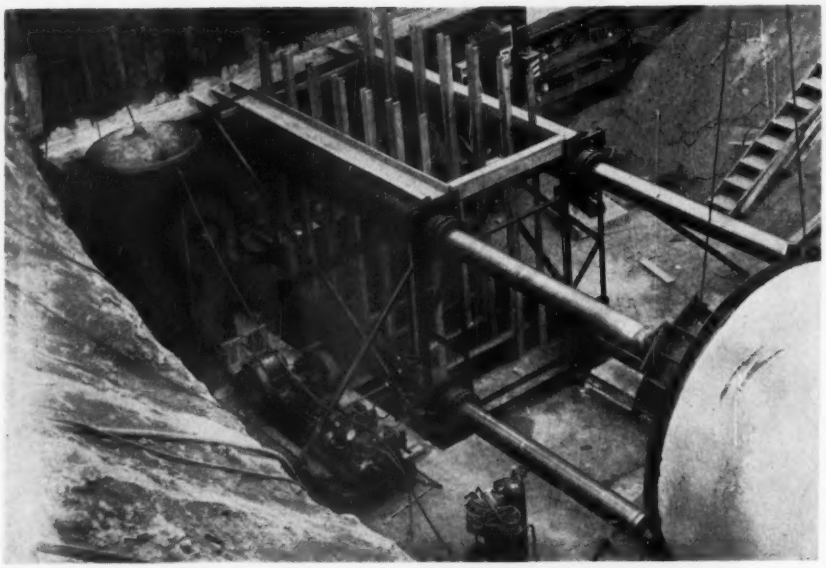


A California contractor probably has set a record by jacking 1,200 ft of 120-in. pipe from a single jacking pit. He attached a boring machine to the front pipe section, set up four underground jack stations, and lubricated the outside of the pipe.

MAIN JACK—In main jacking pit, four 250-ton jacks react against 27-in. WF beams backed by timbers and grouted soil (above). Jacks can move pipe 13½ ft with each stroke (right). Jacking load is distributed to pipe through a fabricated steel ring of ¾-in. welded steel plate. Old conveyor belting protects pipe from damage.



Unusual Jacking Setup Pushes

JACKING 1,200 ft of 120-in. concrete storm sewer pipe from a single jacking pit probably is a record. But, record or not, it's certainly an unusual way to install the pipe.

That's the way Johnson Western Constructors, of San Pedro, Calif., put in a storm drain for the municipality of National City, Calif. They got the $375,000 contract on an alternate low bid based on jacking rather than open trench methods.

They devised a unique combination of methods and equipment. The setup included:

- A boring machine in front of the first pipe section.
- Four intermediate jacking stations inside the pipe to bring the total jacking capacity of the system to 3,800 tons.
- A lubrication system to reduce friction between the pipe and the ground around it.
- An accurate steering system for the lead pipe sections.

National City is located between San Diego, Calif., and the Mexican border. The storm drain job is part of a master plan to provide an interceptor storm sewer that will relieve flooding of sections of the city during heavy rains. Included in the plan are 3,250 ft of 120-in. reinforced concrete pipe that will cost about $1 million. The project will be completed in 1961.

The specifications for 1,260 ft of pipe called for open trench installation, using either precast pipe or monolithic construction. But alternate proposals were considered. Johnson Western's alternate jacking scheme turned out to be the most economical method.

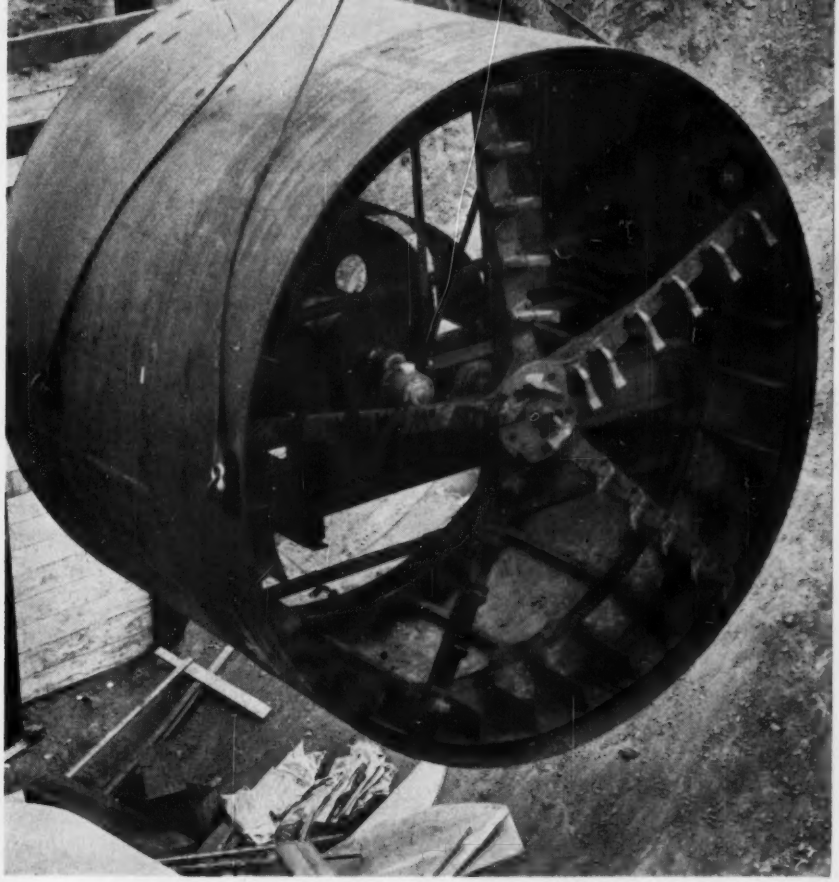
Jacking had an advantage over an open cut because the invert depth was 75 ft. A trench this deep would have required extensive shoring. And the right-of-way was only 100 ft wide, so equipment would not have had much room to maneuver.

Soil conditions also favored jacking. The ground varied from hard dry clay to a cemented sand, gravel, and cobble formation that was almost a conglomerate. There were some loose sandy pockets but no running or squeezing ground. No hard rock or ground water were encountered.

The jacking method had one other cost advantage. The jacked pipe required less reinforcing steel than a pipe installed in an open trench. The reason is that the bearing load on the pipe is less because the overburden is almost completely undisturbed.

Main Jacking Station

First step in the operation was to excavate a jacking pit large



BORING MACHINE—Fastened to leading pipe section, this rotating boring machine cuts hole slightly larger than pipe diameter. Vanes dump earth onto conveyor for removal.

Big Pipe 1,200 Ft

enough to hold the main jacks and provide room for installing the pipe sections. A 50-ton American stiffleg derrick was set up beside the pit to handle the pipe and perform other lifting chores.

In the jacking pit were four 250-ton jacks, each with a 13½-ft stroke. The jacks were powered by a Logemann Bros. two-stage hydraulic pump with a working pressure of 1,800 psi. The jacks were designed by Johnson Western and built by Hydraulic Press and Engineering Co. of Long Beach.

The jacks are supported on a steel frame and react against 27-in. WF beams bearing against vertical 12x12 timbers. Further support was provided by grouting the ground behind the timbers.

The jacking load was distributed to the pipe through a fabricated steel ring of ¾-in. welded plate. The ring was faced with old conveyor belting to minimize damage to the pipe.

Boring Machine

A rotary boring machine chewed away the soil at the leading end of the pipe string. This meant that the jacks didn't have to force the pipe through original ground.

The machine was attached to the first pipe section. It had a rotating ring with five arms that carried hard-faced teeth in a staggered pattern. The teeth at the outer edge could be turned slightly outward so that the resulting bore was bigger than the outside diameter of the pipe.

A steel cutting edge also was rigidly attached to the first pipe section. This, too, was slightly larger than the pipe so that it left an annular space of ⅜ to ½ in. around the pipe. The space insured free passage of the pipe and provided space for the lubricant.

A 20-hp Ingersoll-Rand air motor supplied power for the boring machine. The motor operated through a flexible coupling, variable speed reducer, and chain drive. The cutting head was capable of 6 rpm under load.

The machine had a horizontal travel of 20 in. When it reached its full travel, the cutter head was retracted and the pipe was jacked ahead so the machine could take another bite.

Excavated material fell into vanes behind the cutting head. As the machine rotated, the vanes carried the cuttings to the top of the pipe and dumped them onto a conveyor belt that carried them to a hopper 12 ft behind the face of the tunnel.

The hopper had hydraulic gates that fed the material into a battery-driven, rubber-tired muck car. The car had a removable skip that could be hoisted out of the jacking pit.

Capacity of the muck car was 2 cu yd. This was enough to permit continuous operation of the boring machine for the first 900 ft of the job. For the final 300 ft,

continued on page 114

MUCK CAR — Battery-powered, rubber-tired muck car removes earth from boring machine to main pit. The skip is removable so derrick can lift it out of pit to empty it.

Cat crawler-drawn short work of mean

Scrapers make mountain hauls

A canal across a mountain! That's the job this contractor's doing in Colorado. Brannon Construction Co. is building an irrigation canal from Vega Dam near Collbran to agricultural areas 18 miles away. To make the mountain job even tougher the canal path is mostly rock. Hauls are short—1000 feet maximum. There's little room for turning.

Brannon Construction got set for the job with a spread of three Caterpillar D8 Tractors, two No. 90 Scrapers, a D9 and a D7. A Cat No. 12 Motor Grader—used for sloping the canal sides—completes the spread.

Each D8 pulls a No. 90 Scraper, while the D9 backs them up with its mighty pushloading force. The D7 dozes and pulls a sheeps-foot roller. This efficient spread moves about 4500 yards a day. Even with tricky mountain maneuvering, scrapers make 5 to 6 minute cycles.

This application is another demonstration of the efficiency of crawler-drawn scrapers—on the short hauls, for the rough ground and underfoot conditions that are mean and tricky.

This is exactly the kind of going that Cat crawler-scraper combinations can convert to high production. They're self-loading or, for even higher production, they can be pushloaded. And with the added brawn of recent improvements, Cat crawler-drawn Scrapers haul bigger loads, last longer. Your Caterpillar Dealer has four-wheel Scrapers to match the D9, D8, D7 and D6 Tractors and to fit different hauling needs. And he has the tractors to match any job that comes your way! New 335 HP D9 Series E . . . the new D8 Series H—up 44 HP to 235 . . . the 140 HP D7 Series D. See your Cat Dealer for the quality equipment . . . before you bid on your next tough job.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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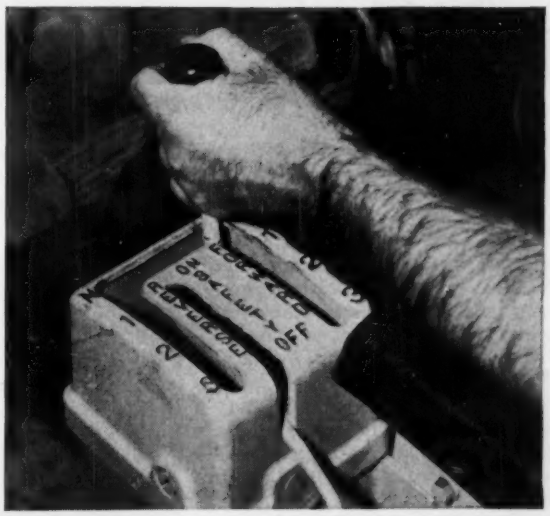
BORN OF RESEARCH
PROVED IN THE FIELD

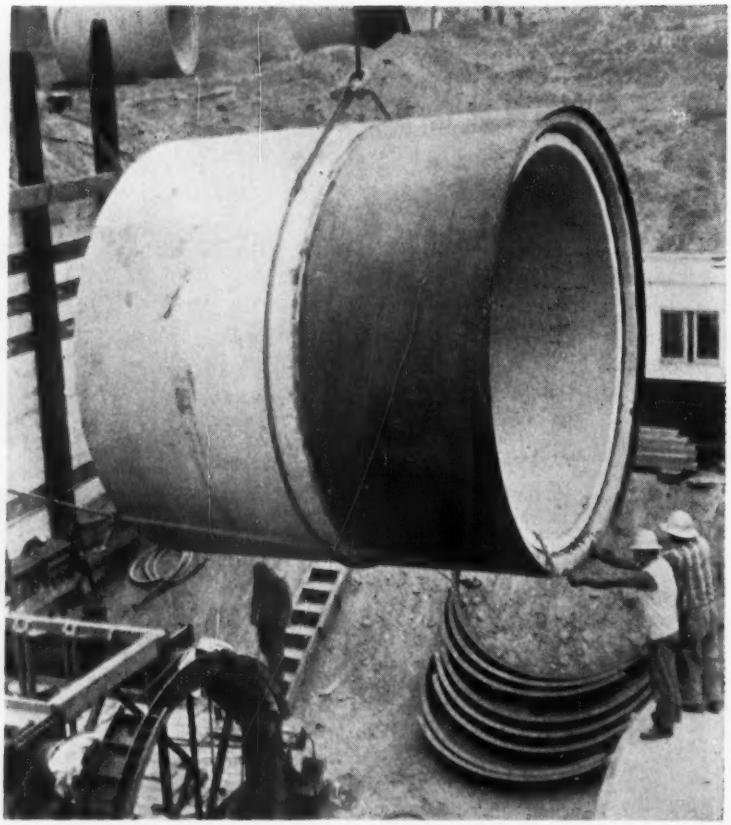


POWER SHIFT TRANSMISSION MAKES THE D8 AND D9 EVEN MORE NIMBLE

Shift on-the-go under full load in a split second. No more clutching. Shift in a single motion with a flick of the selector lever. Even when conditions are as tough as those above, operators will move more dirt with the new Cat power shift transmission.

UNUSUAL JACKING SETUP PUSHES PIPE...
continued

Intermediate Underground Jack Stations Give Pipe Added Push



SPECIAL PIPE—Pipe for intermediate jack station has 5-ft steel sleeve set in recess. Later, when jacks move this section away from adjacent one, sleeve will prevent soil from falling into gap between sections.

JACKS—At intermediate station, pair of 200-ton jacks is mounted on one side of pipe between two steel segments that react against face of joints. Jacks have a 48-in. stroke. Other side of pipe is similar.

progress was delayed periodically because the car could not get back and forth fast enough to empty the hopper.

Intermediate Jacks

To supplement the 1,000-ton jacking force at the main station, four intermediate jacking stations were installed. Three of them mounted four 200-ton jacks; the fourth had two 200-ton jacks.

To make an intermediate station, a pipe section was specially fabricated to carry a 5-ft long steel sleeve. The sleeve slipped over the pipe in a ⅜-in. recess in the outer surface of the pipe. It was welded to a 3x3x¼-in. angle that had been bolted flush into the outside of the spigot of the section ahead of it.

The pipe section with the sleeve and the section ahead of it held the jack supports. When these two sections were installed at the main pit, they were held apart at the joint by a 10x3½-in. circular channel. Then the main jacks pushed the pipe into the hole.

To install the intermediate jacking station, the crew burned out the channel that separated the two pipe sections. In its place, they inserted fabricated steel rings with segments bearing against the pipe joint faces. The rings carried the jacks.

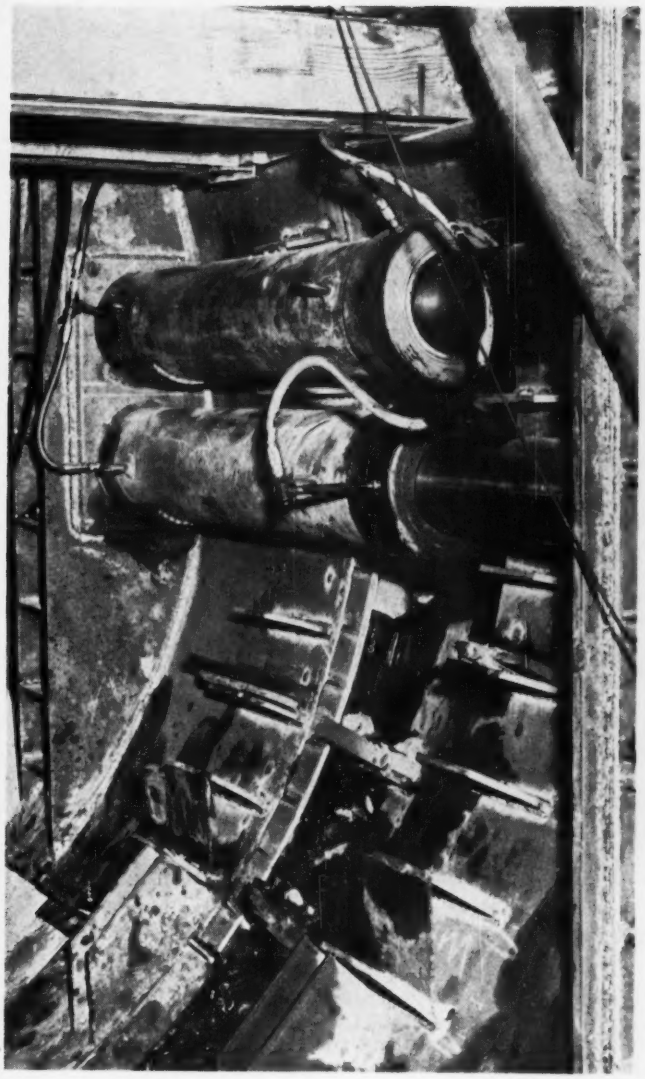
The intermediate jacks had a 48-in. stroke. As they opened up the joint between the pipe sections, the opening was protected from sloughing ground by the external steel sleeve. The jacks and the hydraulic pumps that powered them were built by Rodgers Hydraulic Inc., of Minneapolis.

All four intermediate jacking stations were controlled from a central point by one operator.

Operations

The boring machine operator maintained telephone contact with the operator of the intermediate jacking stations. When the boring machine reached the end of its travel, its operator gave the order to move. The jack station operator pushed the leading string of pipe sections ahead with the forward jacking station until the boring machine operator told him to stop.

Then, by means of selective valves and signal lights, the jacking operator shoved forward each successive string of pipe. The entire string moved forward in an earthworm-like movement until the final gap was closed.



CENTRAL CONTROL — One operator controls all four intermediate jack stations from a central point. Starting with forward sections, he moves one station at a time. Line advances like giant earthworm.

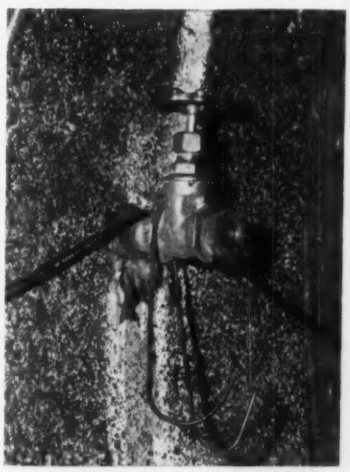
The lead pipe progressed about 5 ft each 8-hr shift. The work continued for three shifts a day, seven days a week. Continuous operation was necessary because the pipe had a tendency to bind if it were left stationary in the tunnel for any length of time.

The movement had to be stopped for as much as an hour to install each new section of pipe. It took somewhat longer to install an intermediate jacking station. During the three months it took to complete the job, there were three major shutdowns for equipment adjustment.

Lubrication

The jacking operations would not have been possible without lubrication to reduce friction on the outside of the pipe.

The lubricant was a specially compounded drilling material prepared by Ken Corp. of Long Beach. It was designed for minimum absorption of water from the soil and for constant viscosity under varying pressures. It consisted of bentonite, water, crude oil, and a jelling agent patented by Ken Corp.

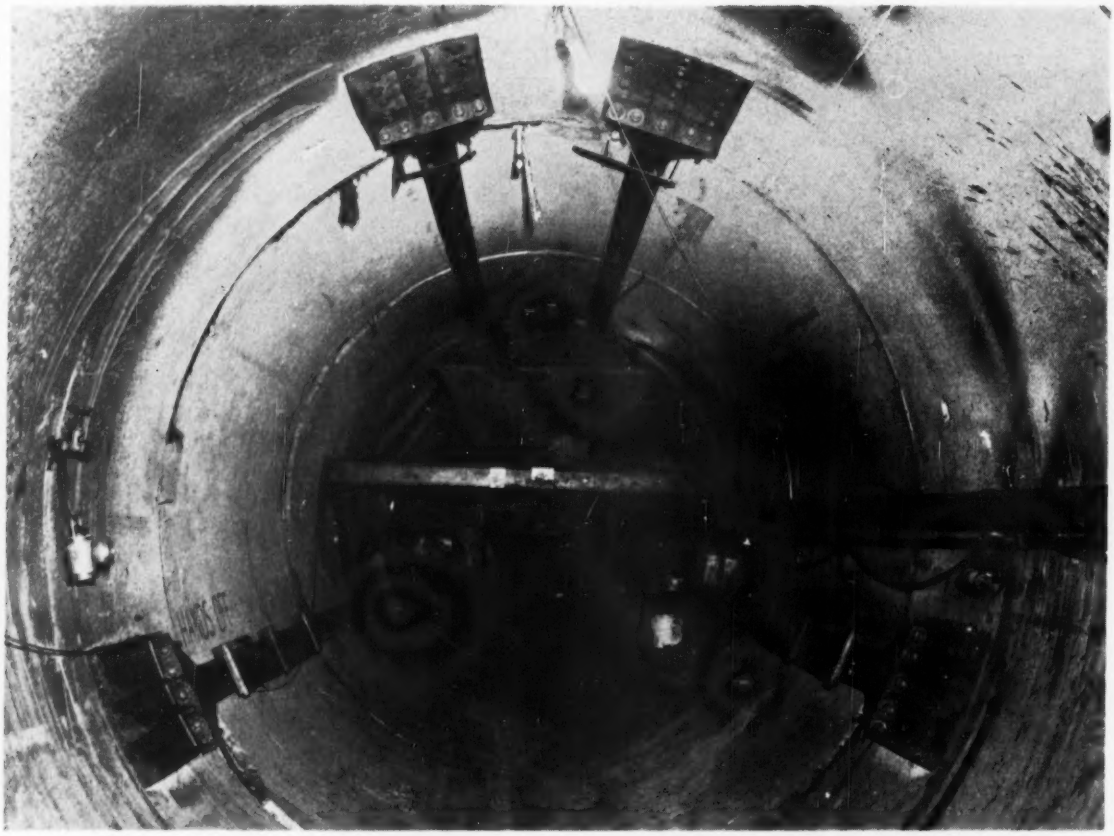


LUBRICATION—Small tubes inserted at intervals through walls of main pipe allow lubricant to be pumped to outside of pipe surface. Lubricant was specially designed.

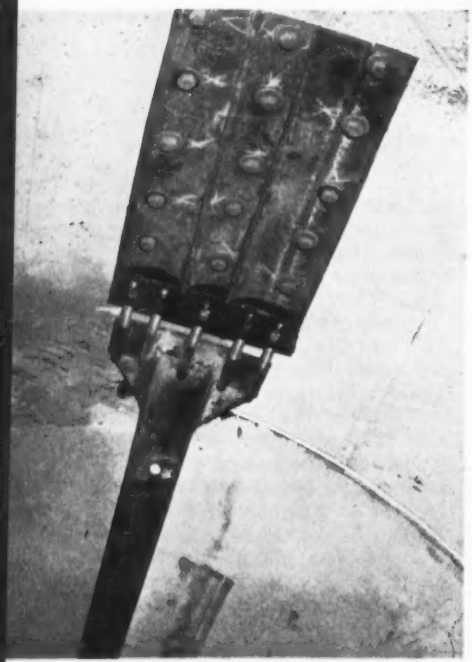
The main injection of lubricant was made at the cutting edge by a system of pumps and manifolded pipes. A thin coating was also applied as the pipe entered the tunnel.

The second main point of lubrication was about 65 ft from the main jacking pit. Here, a 36-in. dia hole was drilled directly over the pipe to serve as a lubricant reservoir.

In addition to these main points, lubrication inserts were installed at intervals along the



STEERING—Four 6-in. channels tie together the first four pipe sections. By tightening or loosening the bolted connections, a man can turn the leading pipe sections.



STEERING CONTROL—Strain gages on channels measure tension exerted by bolts. Early experience on the job told crew how much tension turned pipe a given amount.

pipe in holes drilled through the pipe walls. Lubricant was pumped into these inserts.

The pipe itself was manufactured specially for jacking by the American Pipe and Construction Co. in their San Diego plant. Each section was 120 in. ID, 12 ft long, and had 11-in. walls. The bell end was cast in a steel form to make it smoother. The spigot end was hand finished for the same reason.

To prevent damage to the pipe during jacking, a ring of asbestos insulating material was inserted inside the bell of each joint to distribute the force. This material (Johns-Manville Marinite) had the compressive strength and resiliency needed to take up irregularities in the concrete surfaces—while a pressure of about 1,200 psi was exerted on the pipe.

Steering

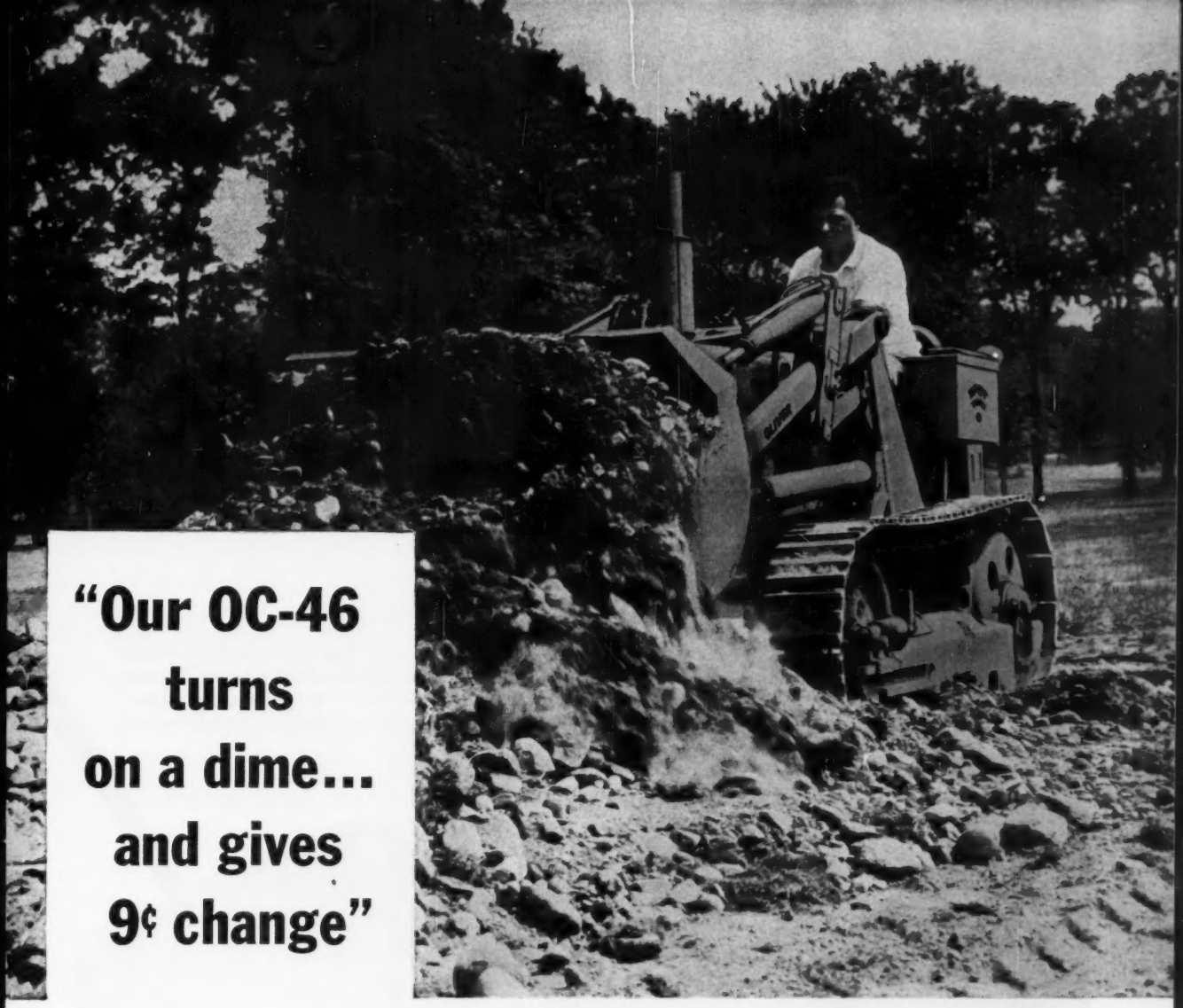
Accurate steering was essential in jacking such a long pipe. Johnson Western used four 6-in. channels to tie the first four pipe sections together into an integral unit. The channels were bolted to the trailing edge of the first section and to the leading edge of the fourth section.

Each channel could be tightened or loosened by a series of 1-in. high tensile bolts at the trailing edge. Strain gages mounted on the channels accurately measured the change in tension. Early experience quickly showed the amount of strain change needed to produce a given change in pipe direction. The result was unusual accuracy in the final location of the pipe.

Men on the Job

The jacking project was conceived and supervised by L. J. Sullivan, president, and R. B. Zinser, vice president and chief engineer, of Johnson Western Constructors. W. J. Parks was project engineer, and A. C. Hill was job superintendent for Johnson Western.

Wayne P. Lill is the engineer on the job for National City.



"Our OC-46 turns on a dime... and gives 9¢ change"

Work-test an Oliver OC-46 loader...see how "Spot-Turn" steering eases all your work!

This Oliver OC-46 works and ranges over hundreds of acres—moving, grading, loading thousands of yards. It's one of six Oliver tractors owned by Baldwin Construction Company, Bloomfield, New Jersey.

Operator Nicholas Psiahas reports on its easy handling and maneuverability: "'Spot-Turn' steering is terrific—the OC-46 is so comfortable to operate. Controls are simple. Our OC-46 turns on a dime...and gives 9¢ change."

Simple operation with low-effort steering is just the start of the OC-46's benefits. This compact, easily transported, ⅝-yd. crawler loader is official champion of its class in *pounds-pull*—meaning greater *work power*. It has the shortest turn radius. A factory-built, *integrated* tractor-loader, the OC-46 has low-profile design with shorter pedestals for greater stability and work safety.

Get all the facts on the OC-46 loader. Choice of 30-plus h.p. gasoline or diesel engine.

LOOK TO OLIVER FOR YOUR BEST BUY IN WHEEL AND CRAWLER TRACTORS

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Dept. 2232, 400 W. Madison St., Chicago 6, Illinois

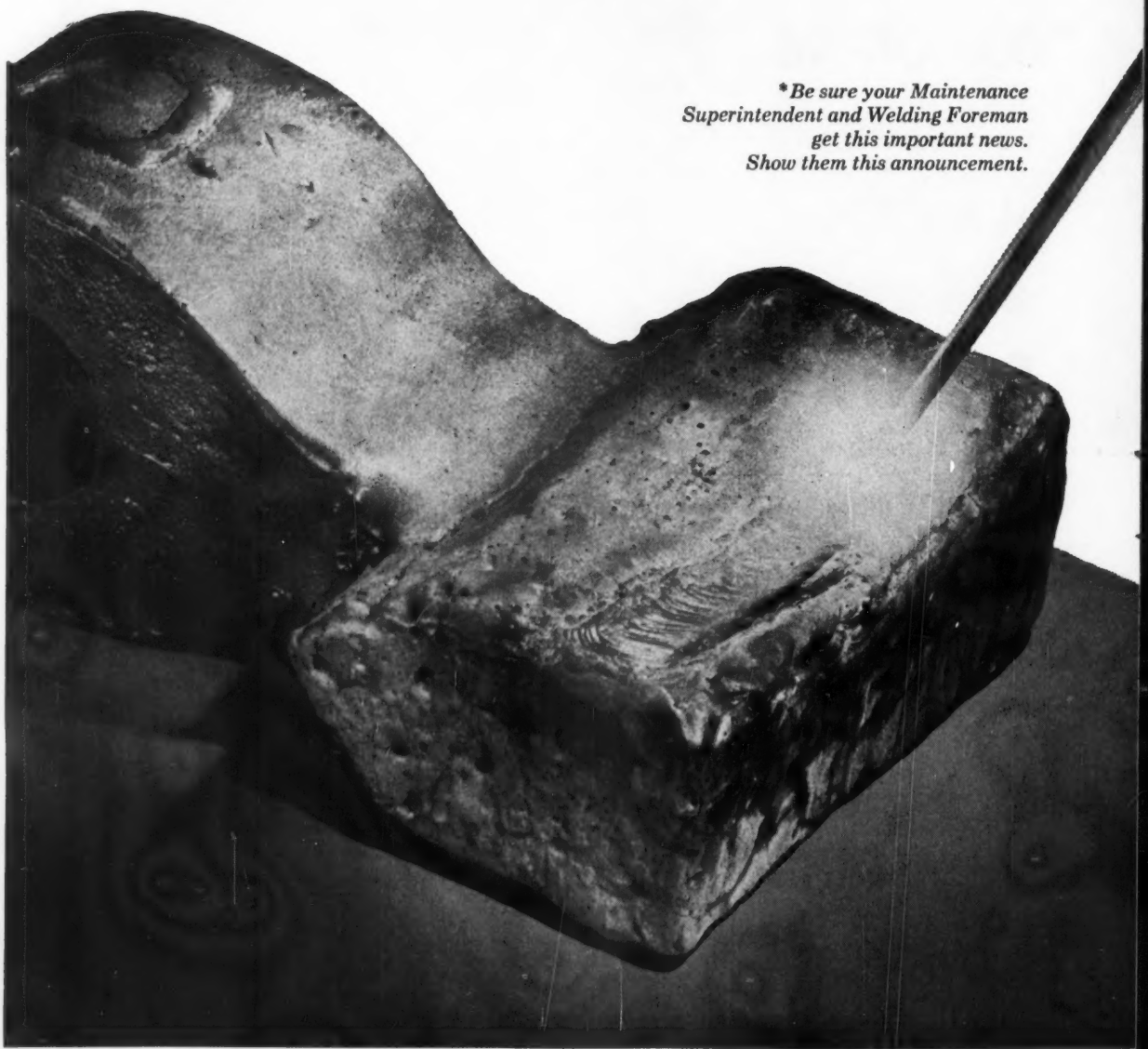
Most versatile, all-job crawler you can own Double the work scope of your OC-46. Add the quick-hitch (only three minutes) Oliver backhoe and handle trenching, excavating and loading jobs of all kinds. Fully hydraulic operation with deep 12'8" digging and high 9'6" loading. Full 180° boom swing. A perfect low-cost digging-loading package for towns, parks, contractors, etc.

Jobs, jobs, jobs—See how valuable the OC-46 can be in your operations. Review its many important features and job advantages in this big, 16-page catalog.

*If you know MANGANESE,**
you'll like this new electrode!

STOODY NICKEL MANGANESE

WITH IRON POWDER COATING



**Be sure your Maintenance Superintendent and Welding Foreman get this important news. Show them this announcement.*

Here's a manganese electrode with improved ductility in weld deposits, freedom from cracks and excellent, overall weldability! Deposits possess full austenitic manganese work-hardening properties, matching manganese base metal, and provide physicals unexcelled in the industry! You'll find these new electrodes "tops" both for *joining* of parts and *buildup* of worn areas on all manganese steel equipment.

STABLE ARC—Unusual arc stability is insured by extruding a concentric alloy coating around a solid wire core. The arc runs smooth as silk with freedom from popping and spatter.

EASY RESTRIKE—One strike and the arc takes off effortlessly.

DENSE DEPOSITS—Deposits are free from porosity. Surface is bright and clean.

FAST DEPOSITION—Weldors lay down more metal with less effort—get jobs done quicker and easier.

EASY SLAG REMOVAL—Jobs clean up faster for multiple passes or in preparation for hard-facing overlays.

WHY WAIT? Check the unusual welding properties of this new, *better* manganese electrode today! Compare it with every other manganese electrode you've *ever* used... you'll agree it's the best in the field! Your Stoody dealer will be glad to have you test it on your own job!

PHYSICAL PROPERTIES:

(Based on tests by independent laboratory)

	DC Straight Polarity	DC Reverse Polarity
Tensile Strength	119,000 psi	111,000 psi
Yield Strength	67,000 psi	66,000 psi
Elongation in 2"	55%	37.5%

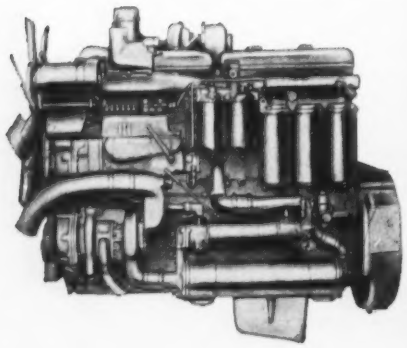
Hardness—Single pass on manganese steel; as deposited—15 Rc, as work-hardened—48 Rc.

Two passes on manganese steel; as deposited—18 Rc, as work-hardened—48 Rc.

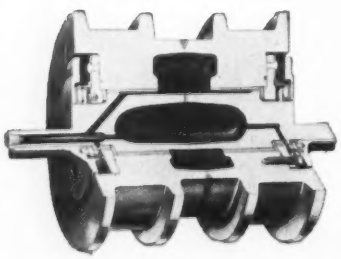
STOODY COMPANY

11902 E. Slauson Avenue, Whittier, California

Three new International TD-25's of contractor V. E. Posey's fleet team up preparing home sites from a mountainside...near San Diego, California. One "25" operator comments: "The power is there, but big engine 'sound and fury' are just about gone!"



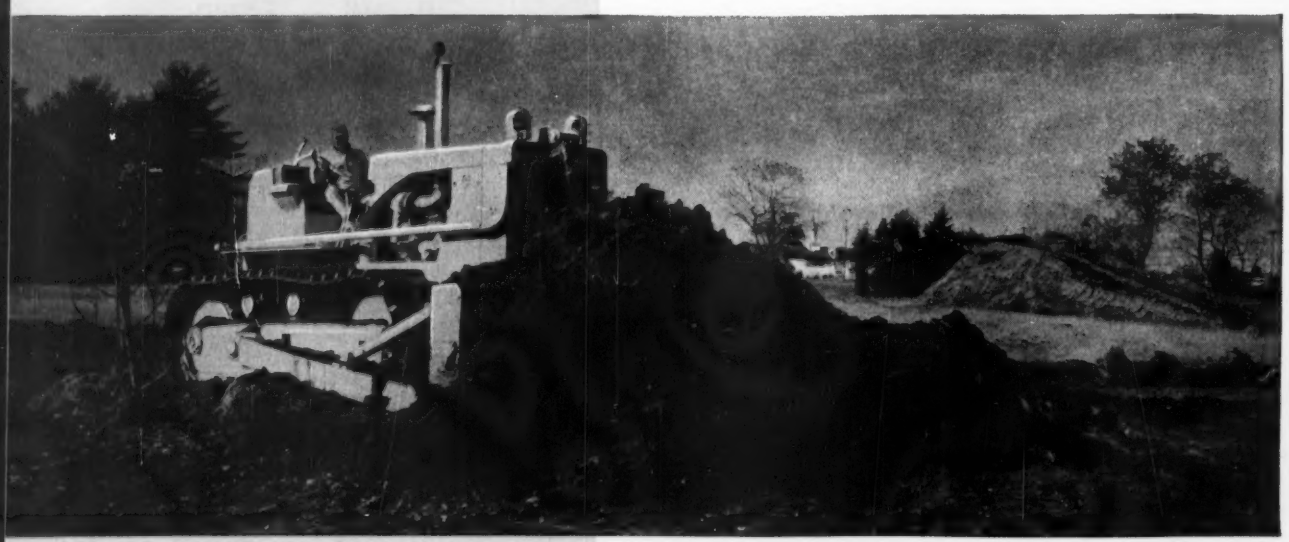
Big power "plus" of the new TD-25 is the new direct-start, 6-cylinder turbocharged International DT-817 diesel engine. Tri-metal crankshaft bearings; valve rotators; dry-type air cleaner; externally-mounted, gear-driven oil and water pumps—all are typical DT-817 long-life, high-output features!



How you get full-

Thick-shelled International Dura-Rollers have king-sized lube reservoirs, positive sealing, and exclusive relief-passage protection from over-lubrication. These *minimum maintenance* track rollers give you practical 1,000-hour lubrication intervals!

Keep full loads on the move full time with exclusive Planet Power-steering. Full power on both tracks, full time, is the answer! And Hi-Lo on-the-go power-shifting lets you match power to condition, instantly, to keep loads "on the move"—and increase speed where practical! This "25" belongs to Berke Moore Co., Inc., Boston expressway contractor!



load turns...full-speed cycles

with proved TD-25 standard equipment!

As standard equipment at no extra cost, the new 230-hp TD-25 gives you the International® proved control combination that has been outproducing king-sized clutch-steered crawlers for years!

You get combined Planet Power-steering and Hi-Lo on-the-go, power-shifting exclusively in the new International TD-25. And you get this basic, built-in design advantage in your choice of torque-converter or synchromesh model!

With this and all its other big advantages, the TD-25 can outearn other big rigs up to 50%—on push-loading, bulldozing, or pulling big drawbar tools such as a shale-shattering ripper!

No "dead-track drag" or "gear-shift lag"!

Planet Power-steering gives you full-time "live" power and traction on both tracks, to make full-load turns—and to eliminate load-limiting "dead-track drag." And Hi-Lo on-the-go power-shifting instantly matches power to conditions to end load-losing "gear-shift lag."

Hi-Lo power-shifting makes the TD-25 the industry's only king-sized 4-speed torque-converter crawler, and the only one with load-matching efficiency-range control. In the synchromesh transmission "25," the Hi-Lo planetary system gives eight speeds forward and reverse. Either model gives you cycle-speeding, up-or-down, on-the-go power-shifting with "finger-tip" ease!

Power-shift and power-steer the new "25" with king-size loads—around curves, upgrade, anywhere. Prove what it means to command full-time, full-load ability to outearn clutch-steered king-sized crawlers, up to 50%—and with standard control equipment! Compare simplified TD-25 design—the only planetary system engineered and located to give you "live track" power steering and on-the-go, up-or-down power shifting! See your International Construction Equipment Distributor for a demonstration!

International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

21,000 BARRELS OF OIL WILL PASS THROUGH THESE FILTERS—

what will they cost you?

You can pay anywhere from $1.50 to $4.75 for a lube filter for a crawler tractor. If you change filters at recommended intervals, about 21,000 barrels of oil will pass through each one. The $1.50 filter can't handle it, so the cheapest filter becomes the most expensive—a fact that shows up in maintenance records. On the other hand, if you pay $4.75 apiece for filters, and buy them by the case, this becomes a pretty expensive item.

The solution is simple. If you change oil at recommended intervals, use the recommended filter. You'll get better filtering over a longer period at reasonable cost. International has tested filter designs for thousands of hours to determine which type filters best for the longest period. And that filter is recommended for your IH equipment. No replacement at any price will give you the engine protection you get with genuine IH filters.

International parts and service facilities are always nearby, with a network of 12 parts depots and 185 International Construction Equipment Distributor outlets. You get the part you want, when you want it!

IH PARTS

International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

Big earthmovers handle and rehandle 500,000 cu yd of earth to build a garden with four lakes on a swampy site.

Dragline, working on a timber mat, digs ditches.

Backhoe shapes flower beds, carves drainage trenches.

Dozers skim off wet peat so scrapers can move in.

Earthmovers Dig a Garden

DRAGLINES, dozers, and backhoes did the spade work for a 125-acre garden in the wooded hills near Tuxedo, N.Y. Sterling Forest Gardens is the central attraction in a 27-sq-mi combination scientific research and residential development.

The site for the gardens was a swamp that acted as a giant catch basin for the rain water running off the nearby hills. Small streams flowed through the area, but they were not big enough to drain the soil adequately.

With the help of expert Dutch advice on drainage and flower growing, the swampy wasteland was turned into a garden with 1,500,000 tulips, 500,000 other flowers and plants, and a series of dams and man-made lakes. Sterling Forest Gardens will cost an estimated $1 million when completed this May. The gardens will be open to the public five months each year, and admission will be charged.

Transforming the swamp into the garden was not easy. The thick layer of marshy soil and peat was covered with heavy underbrush and trees. It had never been cultivated. Plants could not grow in the original soil, and it had to be removed to a depth of about 12 ft, processed, and replaced. This involved the excavation, mixing, and backfilling of about 500,000 cu yd of peat, clay, gravel, and other materials.

In reclaiming the land, the builders wanted to preserve as many of the trees as possible. This drastically reduced the effectiveness of big equipment. Machines could not move around freely because great care had to be taken to avoid damaging good trees.

Earthmoving, both in and out of the garden area, also was difficult. At the start, heavy equipment was practically useless be-

cause it could not move around in the soggy ground—yet it had to be used because the job was much too big for hand labor. Insuring adequate surface drainage was the first problem the garden builders tackled.

Drainage and Clearing

Mole plowing, a drainage method used by vegetable farmers, proved very effective in getting rid of the surface water. This method, also known as subsoiling, provides drain tubes below the ground surface to speed the flow of water.

DRAINAGE — Crew installs perforated pipe that will carry off excess rain water and prevent damage to roots of plants. A total of 36,000 ft of pipe went into the garden.

A wheel tractor pulls behind it a bullet-shaped attachment about 1 ft below the ground. The attachment is mounted on a rigid support with a knife edge that cuts through the top soil easily as it moves along. As the bullet attachment moves through the soil, it leaves a cylindrical opening that acts as a drain pipe, but no pipe is actually installed.

Dead and undesirable trees and underbrush were cleared out at the same time the preliminary drainage work was in progress. The clearing crews were equipped with power saws, brush cutters, axes, tree climbing outfits, snake pants, and bee outfits. Wood chipping machines cut the trees into small chips that decayed quickly in the wet ground. It took 75 men a total 87,750 man hours to complete this work.

Excavation

After the preliminary clearing and drainage, it was possible to start work with the heavy machines. But the going was still tough because the surface layer of soil, as deep as 12 ft, was soft organic material, and heavy machines sank into it. Six crawler-mounted draglines handled the excavation. All of them had to work and move on timber mats.

Four lakes were constructed in the gardens. Three 3-yd draglines dug the lakes. One of the draglines was a P&H, one a Lorain, and one a Manitowoc; all had 85-ft booms.

A fleet of dump trucks hauled the excavated materials to a stor-

Why you'll do MORE work in LESS time... with this NEW tractor-mounted

YORK RAKE

Here's the unit that will speed up both road maintenance and big soil construction jobs . . . save time, labor.

Designed for use with all 3-point hitch tractors, this new Model RH YORK RAKE is easy to handle, fast on the job. It provides 3 important tools in a single unit . . . Rake, Scarifier, Grader Blade. Raising, lowering and tilting of rake are done direct from tractor controls . . . and it turns around on a dime.

Rake works from 7½′ to 10′ wide . . . has 5 angle positions . . . will discharge either to right or left.

Rear mounted caster wheels adjust vertically to regulate working depth of rake teeth.

Scarifier rips up hard ground, tears out stones and roots. Teeth are of heat-treated alloy steel . . . with reversible and replaceable points.

Grader Blade is ideal for light ditching, building shoulders . . . spreads material for finish raking. Blade is raised and lowered by crank-cable assembly.

TOUGH TEETH!

York Rake teeth are tops in toughness. They are made of heat-treated alloy steel . . . tested to stand far more strain than they'll ever see in actual use. That's why they eat up big soil-working jobs in a hurry. "York-quality" teeth are made only by York, and used only in York Rakes.

TRY OUT THIS YORK RAKE!

The best way to prove the advantages of the new Model RH YORK RAKE-SCARIFIER-BLADE UNIT is to try one out. Write us for name of your nearest Distributor. We'll be glad to arrange for you to test an RH unit.

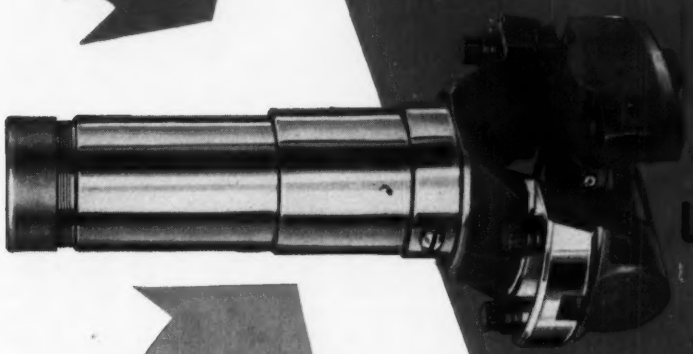
DON'T DELAY . . . ORDER A NEW MODEL RH RAKE FOR YOUR 1960 JOBS

For complete specifications and prices . . . and appointment for RH Rake tryout, see your Distributor or write Dept. C-3 0.

York MODERN CORPORATION UNADILLA, N.Y.

MORE MUSCLE IN A SMALLER PACKAGE... THE NEW

BLOOD BROTHERS "58WB" UNIVERSAL JOINT



To meet new drive line requirements on its 1960 model trucks, a major truck manufacturer needed a special, lightweight but strong universal joint—a unit that would provide greater torque capacity without increasing swing diameter. Rockwell-Standard engineers were consulted, and in a cooperative effort the new "58WB" was developed. It is now being used on several models in the manufacturer's 1960 line.

The design of the new "58WB" is applicable to medium-weight trucks, off-highway equipment, small crawlers and front-end loaders of approximately 1½ yards capacity. It can be made up as a complete drive line, furnished as a component part for a manufacturer's own drive line, or utilized in close-coupled drives. The "58WB" offers these outstanding advantages:

★ **More capacity than any joint of comparable size.** The "58WB" provides 39,000 inch pounds torque capacity with a swing diameter of only six inches!

★ **Key-type yoke.** Requires only four bolts for installation on original equipment. Saves downtime for repairs.

For more details about the new "58WB" or for help in solving any problems involving universal joints or drive lines, write or call us today.

Another Product of...

ROCKWELL-STANDARD
CORPORATION
Universal Joint Division, Allegan, Michigan

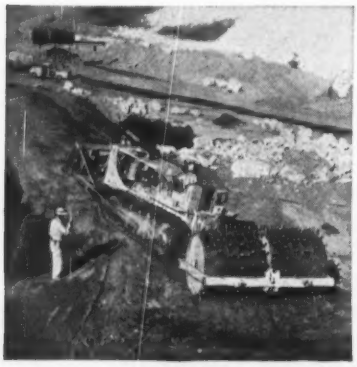
ENGINEER'S FIELD REPORT

PRODUCT **RPM DELO OIL**

FIRM **Silva & Hill Construction Co.**
Los Angeles, Calif.

5,000 hours at 2,000 rpm before overhaul

Working at 2,000 rpm speeds in heavy dust, Silva & Hill Construction Co. operates 8 Caterpillar DW-21s (like one above) five days a week removing 3,500,000 cu. yds. of dirt and rock for Burbank golf course. Firm reports RPM DELO OIL keeps these units rolling an average of 5,000 hours before major overhaul. Says Maint. Supt. H. C. Basinger: "We've got 39 diesel-powered machines working to beat a one-year deadline. Any unexpected delay costs plenty. That's why we stick with 'DELO'. It's proved it will keep equipment rolling longer without engine breakdowns or repairs."



Lubricated with RPM DELO OIL, this Caterpillar D-8 Tractor (left) turned in 10,000 hours, bulldozing and pulling sheepsfoot rollers, before major overhaul. Frank W. Hill (right) Silva & Hill partner, reports: "We've used RPM DELO OIL in all our diesel units since 1940. It has really paid off in keeping our equipment in top running condition."

LUBRICATING OILS RPM DELO

TRADEMARKS "RPM DELO" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

Why RPM DELO Oils reduce wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming.

For More Information or the name of your nearest distributor, write or call any of the companies below.

STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado

EARTHMOVERS DIG A GARDEN . . . *continued*

age area. Here the peat, sand, and clay were separated and processed to fit the soil requirements for various plants. The Lorain dragline, rigged as a shovel, mixed the soil; dozers pushed the materials within reach of the shovel.

Equipment had to move around very carefully to avoid damage to trees that were not removed. Big machines could not maneuver easily between the trees, and, smaller rigs had to take care of the wooded areas. One ¾-yd Northwest and one ¾-yd Unit dragline worked between the trees and in other tight spots. These rigs also dug some of the drainage ditches. A 1½-yd Bucyrus-Erie dragline handled miscellaneous digging and loading. In spite of the lighter weight of these machines, timber mats still were necessary to keep them on top of the ground.

Once the peat was removed, heavy equipment could move around more easily, and two 14-yd Caterpillar scrapers joined the earthmoving. In addition, two D9's, two D8's, and three D6's worked as push tractors, moved boulders, and shaped slopes and lake banks. They also came in handy whenever a truck or machine had to be pulled out of the mud.

SOIL MIXING—Caterpillar D6 dozer pushes sand, peat, and clay within reach of a Lorain shovel that mixes the materials to produce a soil suitable for growing flowers.

The area contained many large boulders. Some of them were too unwieldy to be moved out of the gardens. These were either buried, left in place and fitted into the landscape, or broken up into smaller pieces and moved out.

Backfilling

When enough soil was removed to expose a layer of sand and clay, the bottom of the excavation was shaped and backfilling started. A drainage system to carry off excess water from springs and streams was installed at this time. A blanket of the processed soil completed the backfilling. Trucks and scrapers hauled the materials, andthe Cat dozers and two Michigan loaders spread the backfill.

A second drainage system was installed to carry off rain water.

continued on next page

146 SCREW JACK MODELS TO CHOOSE FROM

THE WORLD'S MOST COMPLETE LINE!

SIMPLEX SCREW JACKS

SCREW JACKS 4-WAY HEAD—19 MODELS
10 to 24 tons capacity.
Ball bearing, Malleable Housing, Safety peep hole.

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20 to 24 tons capacity for close-quarter operation.

TRAVERSING BASES and TRAVERSING BASE SCREW JACKS
7 Models—10 to 50 tons cap.
Vertical & Horizontal travel.

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Adapt to any width of trench.

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12 Models
Util-A-Tool—the tool of a thousand uses.

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2 to 8 tons capacity. 2¾" to 7" high. 1" to 4½" Lift. Swivel head & lock screw.

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WRITE FOR "MECHANICAL JACKS" CATALOG
Other screw types: Steamboat Ratchets & Load Binders, MINE ROOF AND TIMBER JACKS, Rail Puller & Expander, and Gear & Wheel Pullers, Bumper Jacks.

Look for further information on Hydraulic and Lever Jacks in other advertisements.

TEMPLETON, KENLY & CO. 2509 Gardner Road Broadview, Illinois

At this time, also, a sprinkler system was installed to water the plants in dry seasons. An Arps trencher handled the digging for this system.

Fourteen small Oliver and John Deere crawler tractors rough graded the top soil before final landscaping. Ten of the tractors were equipped with dozer blades, and four worked with loader buckets. These lightweight tractors were handy because they did not compact the top soil excessively while moving on it. Scarifiers, disks, rakes, and harrows completed the mechanical landscaping of the gardens.

Individual flower beds had to be dug up to loosen the soil before planting the bulbs. After considering hand labor and several different machines, backhoes were selected for this work. They could maneuver well between the trees without damaging them; each of them could dig up 2 ft of the rock-free soil in one pass; altogether they saved an estimated 1,000 man-hours per day of hand labor. One of the backhoes was a crawler-mounted Caterpillar rig, but one Oliver, one International Harvester, and two Case hoes were mounted on wheel tractors. Final shaping of lake shores, slopes, and dams was left to a pair of Gradalls.

Machines also helped plant trees. A crawler-mounted Case loader and a Hough Payloader carried and positioned the trees for planting. A Michigan truck crane unloaded the trees that were brought by trucks.

In addition to the gardens and lakes, there will be a parking area for 1,500 cars. This, too, is built on a swamp. Parking lot construction was similar to that of the flower beds except that backfill was placed in 6-in. lifts and compacted with a 30-ton tractor-drawn pneumatic roller. The parking lot is topped with 12 in. of bank run gravel, 5 in. of crushed stone, and surfaced with blacktop.

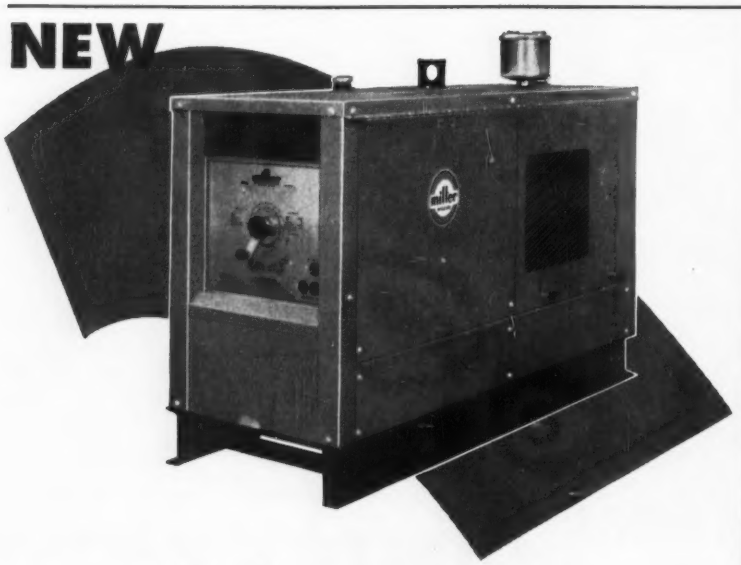
Men and Machines

Director of the job for Sterling Forest Gardens Corp. is W. Fred Johnson. Wm. Rutherford is the landscape architect. Gregory C. Masefield is the administrator, and Wm. Watkins is the construction superintendent. Dutch tulip growers supplied expert advice on planting and sent nine men who trained American personnel how to handle the flowers.

Work has been in progress for nearly two years. At the peak of activity about 250 men worked in the swamps. There were no subcontracts. Instead, Sterling Forest Gardens Corp. hired all equipment and operators from local contractors and dealers.

Heavy machines and operators were supplied by three contractors: Sam Braen, Inc., of Wyckoff, N.J.; Shoreland Equipment Co. of Hazlet, N.J.; and Gates Bros., Inc., of Oradell, N.Y.

Landscaping equipment came from Walter Rudolph, Inc., of Bloomingrove, N.J., a garden and farm equipment supplier. Other equipment suppliers were County Asphalt Inc., of Tarrytown, N.Y., and Kondracki & Brown, Inc., of Sloatsburg, N.Y.; both are general contractors.



Miller Welder/Power Plant Reliability now available with Diesel Economy and Safety

Hercules 38 h.p. 3 cylinder direct injection diesel engine drives new Miller DD-250-L d-c welder/a-c power plant, which *delivers:*

Two d-c welding ranges: 50-200 amperes, 150-350 amperes
Duty Cycle: 100%
Rated output: 250 amperes d-c at 40v, 100% duty cycle
Maximum open circuit voltage: 65
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Power: 12 KW, 115/230v single phase, 60 cycle a-c. Up to 6.5 KW a-c while welding. 1 KW, 115v auxiliary d-c power while welding.

Complete details and engine specifications will be sent promptly upon request.

miller ELECTRIC MANUFACTURING CO., INC. • APPLETON, WISCONSIN
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

This all day sucker . . .

This hose can't kink when twisted, can't flatten when crushed even by the heaviest construction equipment. Acme-Hamilton Suction hose is reinforced with a continuous spiral of special non-metallic resilient reinforcement which gives it built-in bounce! The smooth-bore tube increases rate of flow, reduces turbulence. Costly down-time through accidental crushing is minimized with A — H Cord Suction Hose.

Check these features:

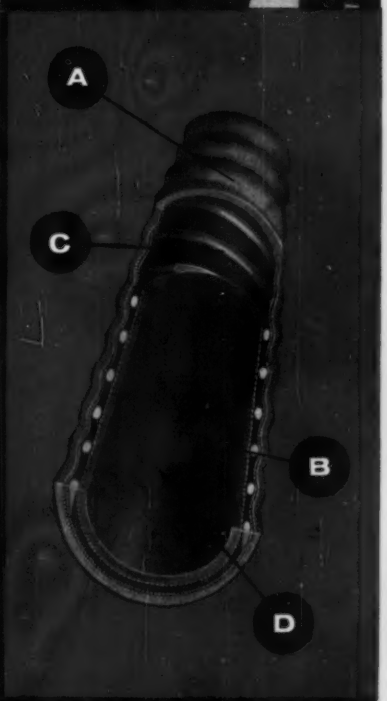
(A) Abrasion resistant red cover.

(B) Cotton duck plies.

(C) Rubber bonded plastic cord in 2½" and 3" sizes only.

(D) Smooth bore tubes.

Specify Acme-Hamilton cord suction hose when you order from your distributor, or write to Acme-Hamilton, Dept. S-3.



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360
MOTOR SCRAPER
ALLIS-CHALMERS

GET POSITIVE PENETRATION AT CUTTING EDGE

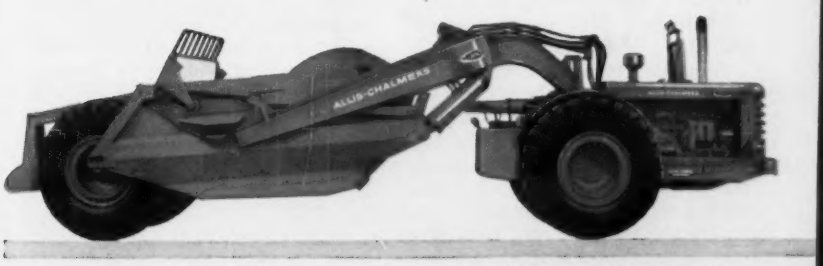
The new, all-hydraulic TS-360 is the only motor scraper in the 30-yd class with double-acting bowl jacks that provide 2-way power for faster loading, more cutting control.

The TS-360's exclusive hydraulic down pressure penetrates quickly into the toughest-loading materials. Penetrating force like this—along with Allis-Chalmers original low, wide bowl—gives you fast, heaped loads every pass.

Slope-cutting is another good example! "Cornering-in" with bowl down pressure lets your operator sink his bit *when* and *where he wants* . . . lets him maintain the best cutting depth while loading. The result: Clean, accurate slopes.

Positive penetration is only one reason you'll get top performance on any size job. *Two-stage steering—forced ejection and highest apron lift—90° steer and* KON-TORK *differential* are earth-moving advantages you cannot afford to overlook.

Put this new 340-hp TS-360 to work for you. Move more dirt per dollar invested than ever before. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



KON-TORK is an Allis-Chalmers trademark.

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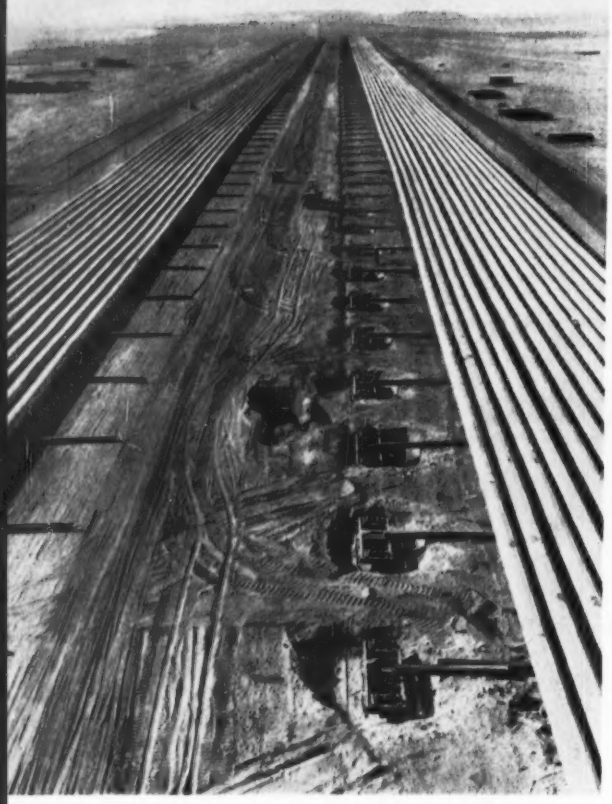
. . . power for a growing world



PIPE ASSEMBLY — Jacks inside launching units pull 4,000-ft- long pipe strings onto rubber tired cradles for launching.

MARKER — Buoy with cable from the barge arrives on shore. It will float over the nose of leading pipe string.

Barge Pulls

Continuous pull of a 30-in. pipeline in the Persian Gulf is the longest on record. The contractor is a specialist in submarine pipeline work.

PIPELINERS working in the Persian Gulf claim a new record for the longest continuous pipeline pull. They hauled a 30-in.-dia line between the coast of Iran to an island 19 miles offshore.

The contractor is International Marine Constructors (Inmarco), an affiliate of Collins Construction Co. of Port Lavaca, Tex. The long underwater link is part of a 99-mile pipeline that will carry Iranian crude oil from an inland oil field to a deep water port on the island of Kharg.

Inmarco set up a base on the island of Khargu, about 3 miles closer to shore than the terminus on Kharg. First they pulled a string of pipe the 3 miles between the two islands. Then they made the 19-mile continuous pull from Khargu to the mainland and connected the two underwater sections with a 2-mile overland link on Khargu.

Pipe arrived at Khargu in 26-ft lengths. It was assembled on skids and welded into strings 4,400 ft long for the short pull to Kharg and 4,000 ft long for the long pull to the mainland. All welds were X-rayed and the negatives developed in a portable laboratory.

Inmarco's crews gave the pipe a corrosion protection coating of coal tar enamel, Fiberglas and asbestos felt, then encased it in 2½ in. of mesh-reinforced concrete to protect the coating against abrasion and to provide additional weight for the necessary negative buoyancy.

The same barge handled both pulling operations. Mounted on its bow was a Collins Seamaster winch capable of exerting a maximum pull of 440,000 lb. During the record pull, the barge was held in place by long-distance cables anchored to a concrete deadman on the mainland.

The Long Pull

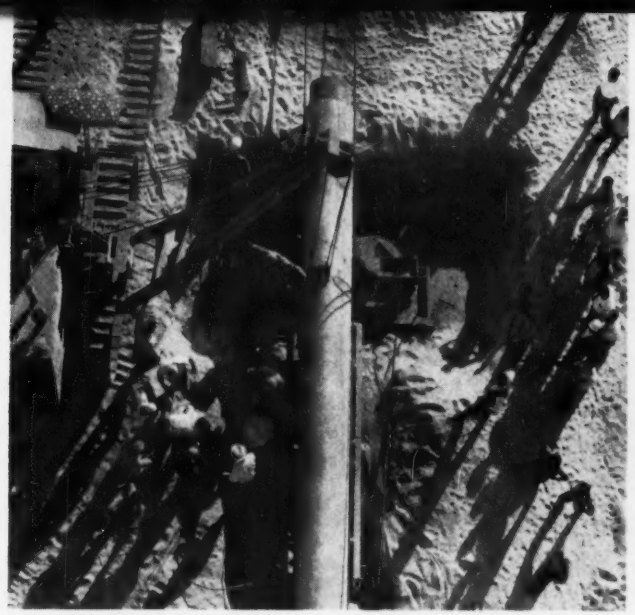
After constructing the deadman, Inmarco laid an anchor line. The barge headed from the mainland toward Khargu, reeling out two anchor cables from a pair of spooling devices.

At Khargu, they unwound a 2-in. cable from the double-drum Seamaster winch and passed it through a sheave connected to a pulling head welded to the first 4,000-ft string of pipe on the launchway at Khargu.

Then the barge backed off shore a distance of 4,000 ft by coiling in its anchor cable and paying out the cable from the pulling winch. On the barge deck, the two anchor cables passed from the reels through carpenter stops. An equalizing block kept the same tension on both cables while the winch pulled the first string of pipe down the launchway toward the barge. The pull stopped before the land end of the pipe entered the water. Then the barge backed up another 4,000 ft while a second pipe string was moved onto the launchway and welded to the first pipe string. The pulling procedure was repeated until the barge reached the mainland.

At each pulling station, anchors dropped from the fore and aft quarters of the deck kept the barge from drifting sideways.

While the winch pulled the pipe out to sea a Collins holdback winch, anchored at the end of the launchway, applied a restraining force of 5 to 10 tons on the land-



UNDER TENSION—Workmen take dynamometer reading on holdback cables that keep the proper tension on pipeline during pull. Cables attach to clamp around pipe.

LAUNCHING—Pipeline enters the water from the launchway. All pulling operations are coordinated from tower that is linked by radio to barge and holdback winch.

Underwater Pipeline 19 Miles

ward end of the pipe. A running cable connected the winch to a holdback clamp around the pipe.

Controlling the Pull

This restraining force served several purposes. It controlled the ratio of pull required to move the pipeline toward the barge; it kept the pipeline under tension so that it could be pulled on a straight line; and it prevented the pipeline from running down the launchway in the event of failure anywhere along the line.

Before the pipe entered the water, workmen attached another set of cables to the holdback clamp. These cables ran back to a concrete deadman. The pull continued until dynamometer readings indicated that the strain on these cables was sufficient to keep the pipeline from rolling down the launchway. Then Inmarco removed the winch cables, transferring the complete restraining force to the deadman.

At this point, the next pipe string was placed on the launchway and welded in place. Workmen attached a new holdback clamp and connected the cable from the holdback winch. The winch assumed the restraining force again, taking the tension off the deadman and permitting the

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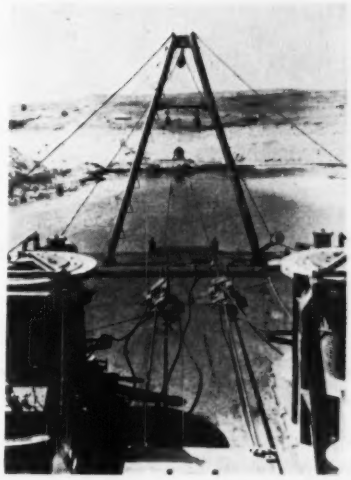
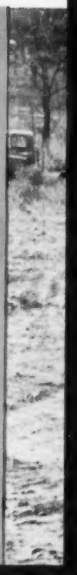


LAST PULL—Barge backs up final 4,000 ft by coiling in its anchor cables around the reels on deck. Cables extend to a deadman on shore to hold barge during pipeline pull.

PIPELINE PULL—Cables from Seamaster winch pull the pipeline along the sea bottom for 4,000 ft toward the barge. Buoy marks position of leading end of pipeline.

C-350 BANTAM with long side frame and long back hoe attachment ditching along side road. Long-boom back hoe enables Druyvesteyn to travel on the road, eliminating the need for expensive matting in the soft ground of the ditch. "BANTAM's long boom made money for us on that job," states Parsons.

"With that long boom, BANTAM lets us dig an 18-foot sewer line easily. We don't have to worry about 'digging in,'" says Parsons. BANTAM's long track provides maximum stability for the deep dig into wet, claylike earth.



Low ground pressure of the C-350 lets BANTAM wade right into marshy area on a land reclamation project. "BANTAM is the perfect machine for all our work," says this contractor. "You can go anyplace with it."

"Our business is based on BANTAM!" New C-350 "makes many of our jobs a one-machine operation"

Sewer work . . . excavating . . . land reclamation . . . foundations . . . hanging steel—"Our BANTAM does 'em all," says Jimmie Parsons, president of Druyvesteyn Construction Corp., Fort Smith, Arkansas. "We don't turn anything down, because *our business is based on* BANTAM. It goes anywhere . . . does everything . . . saves us time and money on every job.

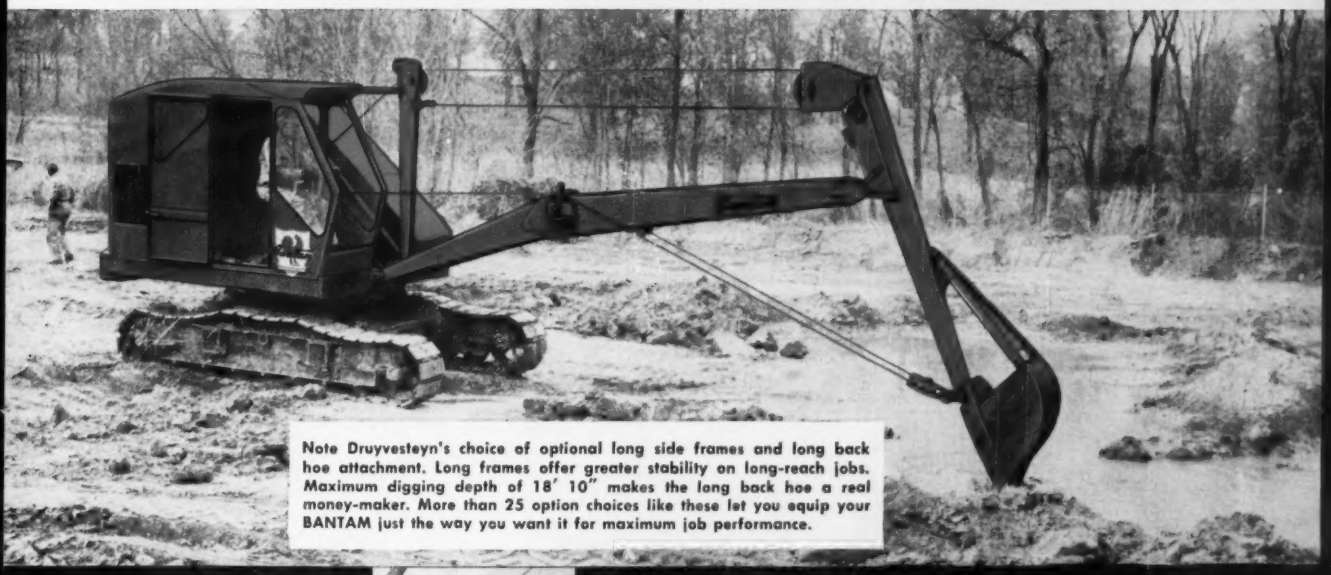
"Take ditch digging. We can walk our new, long-track BANTAM across a wider ditch and save going around the job. I figure that saves us $1500-plus a year in time alone. And those longer tracks give us greater stability, whether we're digging with the hoe or using the BANTAM as a crane.

"Man, that BANTAM long boom is wonderful! We couldn't dig without it. We never worry about 'digging in' to get depth. We save over $500 on our deep jobs because we can dig to 18 feet, 6 inches with our BANTAM. And that long boom gives us so much reach, we keep our BANTAM on solid ground when trenching in wet, muddy areas—saves us the expense of matting under the machine and we can move right along.

"Our BANTAM C-350, with the long boom and extended track, makes many of our jobs a one-machine operation. We can dig deep . . . dig in 'off' position . . . backfill . . . level the grade . . . load waste earth . . . handle materials —all with one machine—BANTAM. That saves, or I should say, *makes us money!*"

Let BANTAM give a big boost to your profits. BANTAM's all-new design, big-rig capacity and faster performance

See how you can profit more from BANTAM's greater job range! Mail the coupon for complete information



Note Druyvesteyn's choice of optional long side frames and long back hoe attachment. Long frames offer greater stability on long-reach jobs. Maximum digging depth of 18′ 10″ makes the long back hoe a real money-maker. More than 25 option choices like these let you equip your BANTAM just the way you want it for maximum job performance.

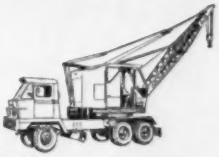
"If I were going to buy a machine tomorrow, I'd buy BANTAM," says President Jimmie Parsons of Druyvesteyn Construction Corp., Fort Smith, Arkansas. "BANTAM stands up in our work. It's simple to operate, easy to maintain."

give you more advantages than any other crawler in its class. Whatever the job, BANTAM's speed, power and capacity are sure to net you greater profits.

Match your BANTAM to your specific job and price needs. Choose from more than 25 job-speeding options for a tailor-made, money-saving machine.

See and try BANTAM soon—right on your own jobs!

Work and earn with 11 versatile attachments



T-350 11-ton capacity

Biggest crane capacity in its class! Choice of four BANTAM-built, high-stability carriers lets you mount booms to 70 feet . . . jibs to 15 feet.

CR-350 11-ton capacity

This versatile contractor's tool saves money on hundreds of lifting, handling, digging jobs . . . travels and works with one man, one engine.

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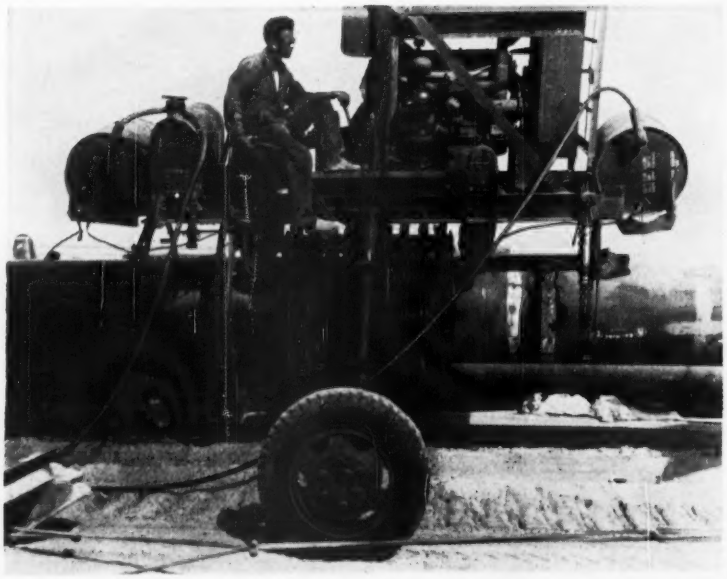
Crews Assemble Strings of Pipe On Island Base

WELDING—Butt-welds connect the ends of two 4,000-ft-long pipe strings on launchway.



COATING—Line-traveling machine applies a primer coat of coal tar enamel to protect pipeline against corrosion. Then, the pipe is wrapped in Fiberglas and asbestos felt.

CONCRETING—Transit-mix trucks pour concrete casing around the pipe while a crane farther down the line places forms. Mesh-reinforced concrete casing is 2½ in. thick.

removal of the first clamp. By this system, the pipeline was kept under constant restraining force.

About eight hours elapsed between the end of one 4,000-ft pull and the start of the next. Control of the pulling and restraining operations was handled from an 86-ft-high tower that straddled the launchway. The project manager in the control tower relayed instructions via two-way radio to the operators of the pull winch on the barge and the holdback winch on the island. The pull barge was kept in line with theodolites, controlled from the tower at Khargu and from two other triangulation towers on the mainland.

The pipeline was pulled on a straight line along the sea bottom at depths of up to 160 ft. High seas and strong currents ruled out other methods of laying the pipe. The pipe weighed 445 lb per ft on land, but in the water it weighed only 4 lb per ft.

Preliminary surveys of the sea bottom determined the route the pipeline was to take. The underwater route was checked by divers and instruments.

The project was built for the Iranian Oil Exploration and Producing Co.

Laying of the submarine pipe was under the direction of S. V. "Sammy" Collins, head of Collins Construction Co. and Inmarco.

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GENERAL TIRES

will outlast . . . outdrive any other truck tire ever built!

For top performance at the lowest cost-per-mile, roll your units on General Tires. Built with exclusive Nygen Cord and tread-designed for sure-footed power and traction, General Tires will keep your projects on schedule . . . help insure deserved profits. In construction, logging, quarrying or mining there's no tire to equal General.

THE GENERAL TIRE & RUBBER CO. Akron, O.

Geared by Fuller with off-highway '1220 Series Transmission . . .

Faster work cycles with countershaft brake and longer life with pressure filtration system

Eight Allis-Chalmers TS-260 Scrapers with Fuller off-highway '1220 Series Transmissions are boosting profits for Ben Haskins Construction Company on Oklahoma highway projects. All 8 of Haskins' '1220 Series Transmissions are equipped with Air-Powered Countershaft Inertia Brakes and Pressure Filtration Systems for the gear oil.

President Ben Haskins says, "Fuller '1220 Transmissions have helped make our operation more profitable. They're trouble-free. The transmission countershaft inertia brake permits quick, easy upshifts without double clutching. Faster shifting gives us faster work cycles . . . the pressure filtration system for the gear oil prolongs gear and bearing life . . . I'll insist on both the brake and the pressure filtration system when I buy equipment in the future."

For long life, easy shifting and positive lubrication in your scraper operations, specify Fuller off-highway Transmissions which include the countershaft inertia brake and pressure lubrication and filtration systems as standard equipment. Ask your dealer about these new features designed to provide *you* with a better margin of profit.

FULLER

TRANSMISSION DIVISION
MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

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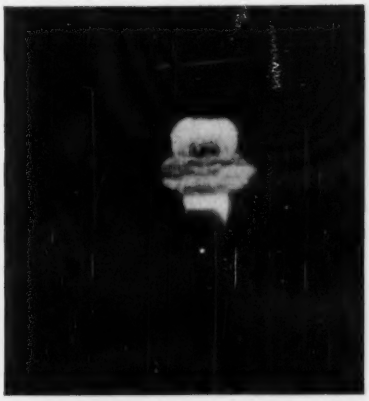
Birth Of A Blast

Many unique tools are used by Spencer Chemical Company in blasting research. For example, these exclusive photos, taken at intervals of seven millionths of a second by a special camera, record the detonation of a 4-lb. mixture of Spencer N-IV Ammonium Nitrate and fuel oil.

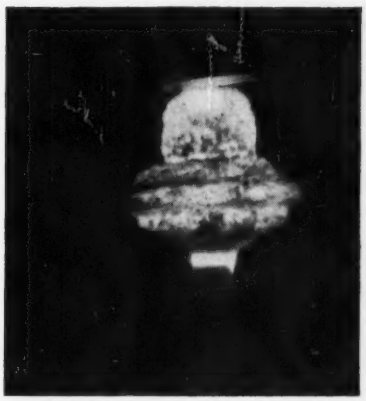
Research like this, conducted by Spencer's own staff, and sponsored by Spencer at leading U. S. research centers, results in new and better ways to use Spencer N-IV and fuel oil for blasting.

Spencer Chemical Company would like to share this knowledge with you. For information, use the coupon below.

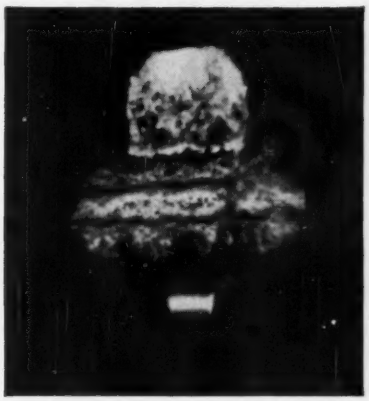
2:13 P.M. The 13"-long charge, containing 94% Spencer N-IV Ammonium Nitrate and 6% fuel oil is about to be detonated.



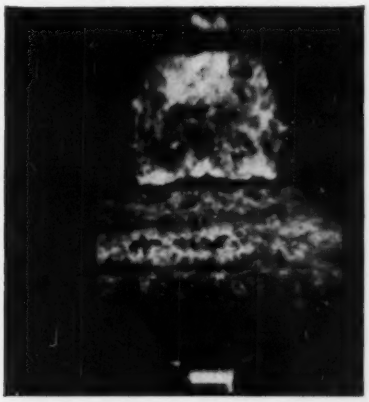
2:13.000028 P.M. The detonation wave has already spread over nearly one-third of the Spencer N-IV—fuel oil mixture.



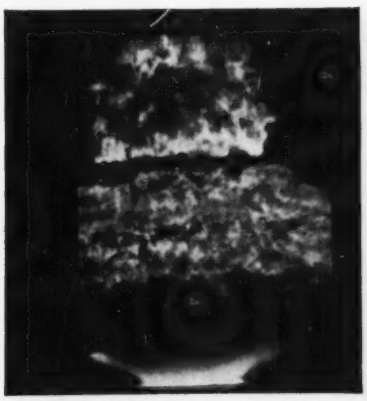
2:13.000056 P.M. This mighty, but controllable, energy is partly a result of N-IV's special structure and greater nitrogen content.



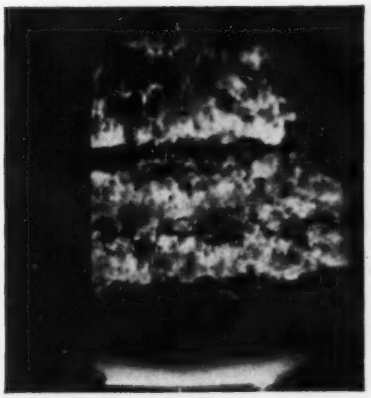
2:13.000088 P.M. Shown here is the great detonation velocity of the N-IV—fuel oil mixture. Yet, N-IV is safe to store and handle.



2:13.000128 P.M. The continuous and even release of energy shown here is a result of extensive Spencer research.



2:13.000160 P.M. Near maximum energy is now being released by the low-cost Spencer N-IV Ammonium Nitrate—fuel oil mixture.



2:13.000184 P.M. Full detonation! For information on how you can use Spencer N-IV Ammonium Nitrate, fill out, mail coupon at right.

SPENCER®

Spencer Chemical Company
409 Dwight Building
Kansas City 5, Missouri

I want to know more about:

☐ Spencer N-IV Ammonium Nitrate as a blasting ingredient.
☐ Spencer Powder Monkey.

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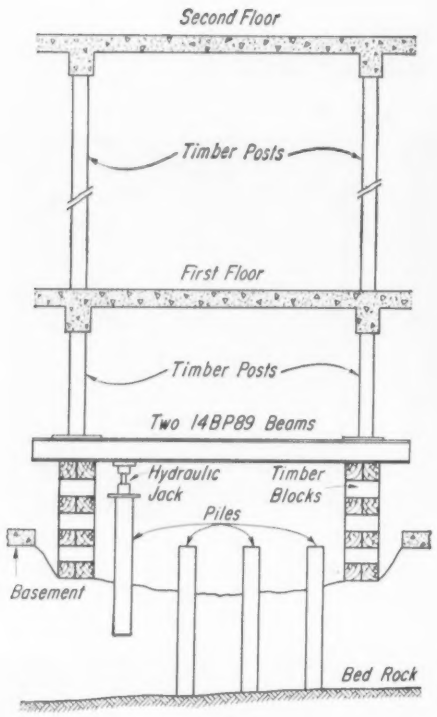
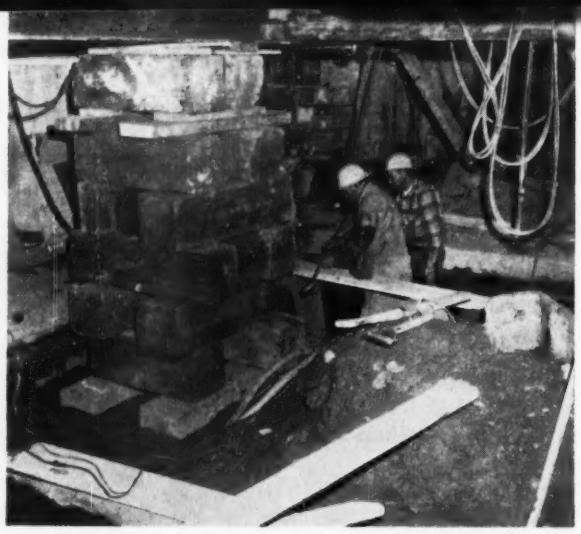




JACK SUPPORT—Workmen check timber cribwork supporting the WF beams that carry the jack. First floor beams take the jack reaction.

Jack Sinks Piles For Foundation

CONSTRUCTION METHODS editors, busy keeping track of construction projects all over the country, nearly overlooked an interesting job going on literally under their feet in the basement of the McGraw-Hill Building.

The Chase Manhattan Bank, a tenant in the building, is moving its branch office from the east side of the ground floor to enlarged quarters on the other side of the building. So far, the job has been a straightforward one, except for the foundations for the bank vault.

When Spencer, White & Prentis, Inc., of New York, who were handling the foundation work, removed the basement floor slab, they found that the ground had almost no bearing value. In addition, ground water was only a foot or so below basement level.

It was evident that the south wall of the heavy vault could be supported on a system of beams spanning between the piers of two of the main building columns. The consulting engineer—Seelye, Stevenson, Value & Knecht—obtained the approval of the New York City Building Department to place the required additional loading on these piers.

The north wall of the vault was a tougher problem. To dig down to the rock and install footings would have been costly because of the high ground water level. Also, it would have been messy because all of the excavated material would have had to come up to the first floor to be removed from the building.

So Spencer, White & Prentis decided to use jacked piles. They figured that, because of the limited headroom, driven piles would have cost as much as, if not more than, jacked piles. And driving piles in the basement would not have been a particularly popular procedure with the occupants of the building.

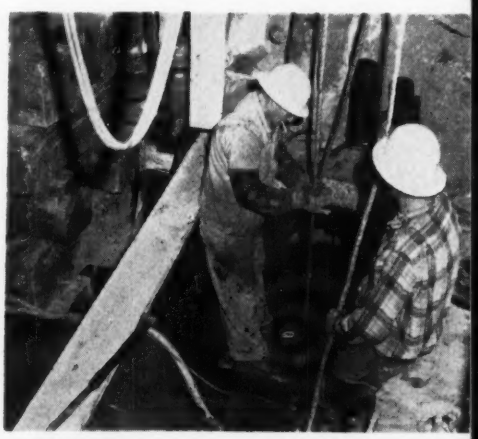
To jack the piles, the contractors had to set up a reaction for the jack. They figured a first floor beam directly over the line of piles would be sufficient. But to be certain, they extended posts upward to brace the first floor beam against the corresponding beam on the second floor.

The jack support was relatively simple. At each end of the proposed line of piles, crews built up cribwork piers of heavy timber. Across the piers they laid two parallel 14BP89 beams to carry the jack.

Between the top of the beams and the permanent beam of the first floor, they wedged two 10x10 timber posts to transfer the reaction of the jack to the floor beam. A second set of 10x10 posts was wedged between the first and second floor as added reinforcement.

Each of the four piles was 12¾ in. OD with walls 5/16 in. thick. A single jack drove each of them in turn. On the average, they hit bedrock 10 ft below the basement floor. When the pile reached rock, men with a hand-operated orange-peel bucket excavated the earth from the piles. Then they filled them with concrete.

They tested each pile with a 50-ton load. Design load was 25 tons each. A reinforced concrete beam will span the piles to support the north wall of the vault.



EXCAVATION—Men clean out piles with orange-peel bucket, then pour in concrete.

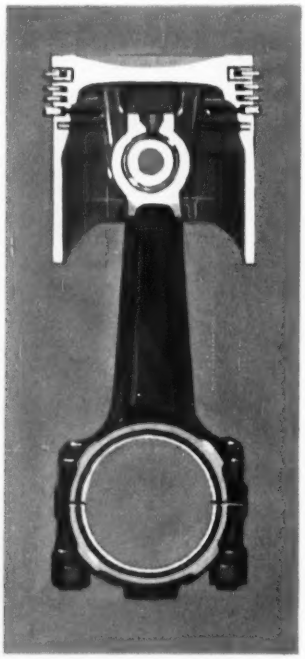
NOW longer-lasting, high-per

EXCLUSIVE NEW V-6

Life expectancy: 3 times longer! Completely new design, more compact and stronger! Actual tests prove these advanced V-6 engines can give you up to 200,000 miles of continuous operation without a major overhaul.

EXCLUSIVE NEW TWIN-SIX

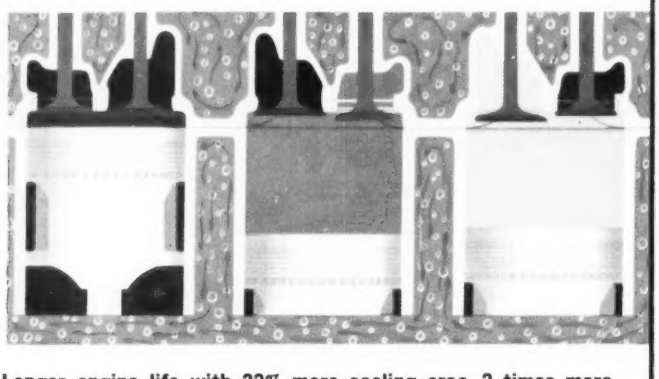
Most power of any standard gas engine! Highest torque over a broader, lower, easy-stroking rpm range saves fuel, reduces engine wear and cuts shifting up to 60%.



Pistons are exclusively GMC designed and built for best sealing and longest life. Special casting with the head down assures more strength at the top where it's needed. 4-ring pistons have cast-in steel band to control expansion. All pistons are extra-heavy-duty design, yet every one is precision balanced to 1.8 grams for vibration-free performance, measured to .0003 inches for a perfect fit.

Massive, high-strength GMC connecting rods are drop forged, heat treated carbon steel. Every one is precisely balanced to less than 2 grams tolerance for smooth, lasting operation.

New, big-diameter GMC bearings last 7 times longer than others. M400 bearings will take the heaviest loads under the most extreme operating conditions.



Longer engine life with 33% more cooling area, 3 times more water volume than comparable engines! Notice the extra-wide water passages that completely surround each cylinder! See the widest spaced valves with the biggest cooling area for rapid heat dissipation! No two exhaust valves are adjacent! New high-volume water circulation (up to 176 gallons per minute) assures less than *4 degrees* temperature variation throughout. These are the most efficiently cooled engines with every feature to eliminate life-killing "hot spots".

NEW GMC GAS ENGINES . . . PROFIT-PERFORMANCE ON EVERY HAUL		
Model	Gross Torque Range	Max. Horsepower
305A	258-260 @ 14-2200	150 @ 3600
305B	264-266 @ 11-2000	150 @ 3600
305C	268-270 @ 12-2100	165 @ 3800
351	308-312 @ 14-2400	180 @ 3400
401	375-377 @ 12-2000	205 @ 3200
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See the
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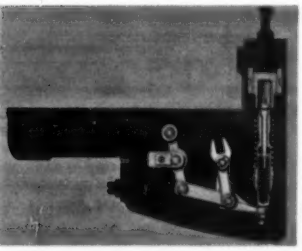
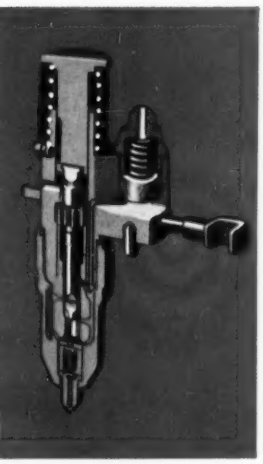
NEW V-6 DIESELS

Most power per dollar! New high-performance, fuel-saving GMC Truck diesels have proved, efficient 2-cycle design with power on every downstroke to give you more power per dollar, more power per pound, more power per cu. in. displacement.

New 6V-71 engines have all the proved performance, economy and durability features of the famous 71 Series, the power plants that are so well known in the construction business . . . in trucks and heavy-duty service equipment.



Only GMC Trucks have this economy range governor that positively controls engine speed in top gears at most efficient point for outstanding fuel economy.



Simplest, most practical and durable, and least expensive diesel fuel system of all! GMC's precision-built injector meters exactly the right amount of fuel to each cylinder, times the injection and atomizes the fuel for most efficient burning . . . eliminates troublesome high-pressure lines and complicated pumps.

- GMC Truck diesels have *four* exhaust valves per cylinder (not 1 or 2) for complete scavenging of all gases and freer breathing.
- Automatically save up to 5% fuel, get up to 7% extra hp. with the standard, exclusive hydraulic fan.
- Up to 530 pounds lighter than comparable horsepower diesel engines.
- Cut costly downtime and expense with complete one-stop parts and service at every GMC Diesel Truck Dealer.

POWER-MATCH YOUR JOB WITH NEW GMC DIESEL POWER		
Model	Max. Torque	Max. Horsepower
6V-71	577 @ 1200	189 @ 1800 or 210 @ 2100*

No extra cost

ee the Yellow Pages for your nearest GMC Dealer . . . for actual comparisons that rove GMC Truck superiority.

YOU CAN DRASTICALLY CUT YOUR HAULING COSTS

thanks to the BIG GMC BREAKTHROUGH in truck engineering

PULL

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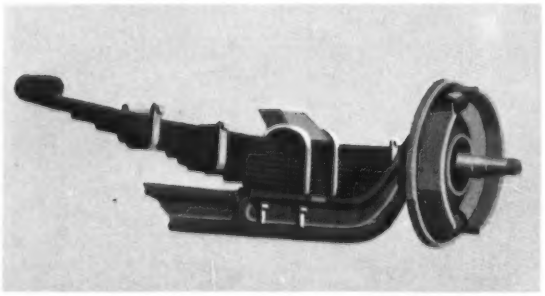
TRUCKS

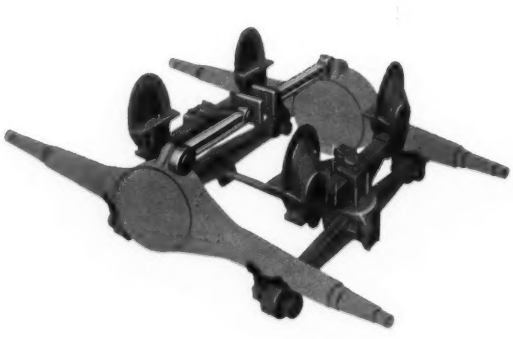
From ½-ton to 60-ton
General Motors leads the way!

Haul giant construction loads -- up to 120,000 lbs. GCW -- with this new BW9000 Series Conventional Ninety-Incher. New 702 cubic-inch Twin-Six with the most pulling power of all, plus maximum reduction of 124.46 will get your biggest loads moving and keep them rolling, anywhere. Easy-to-service 90" BBC "Cost-Busters" range from 19,500 lbs. GVW up.

NOW you can cut job time, cut costs with t



New, Stronger Front Suspension and Springs! New GMC heavy-duty models are easier to drive and last longer, too. You get increased stability, shorter turning and improved handling with longer-lived, wide-track I-beam front axles. New, longer, wide springs have more capacity, greater load-cradling flexibility.

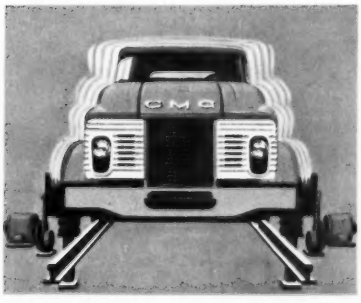


Bigger Payloads, Less Maintenance! With this new GMC tandem suspension you have less unsprung weight, less truck weight for bonus payloads. Rubber mounts and bushings at all wear points practically eliminate service. True alignment of axles and equal load distribution at all times increase tire and axle life.

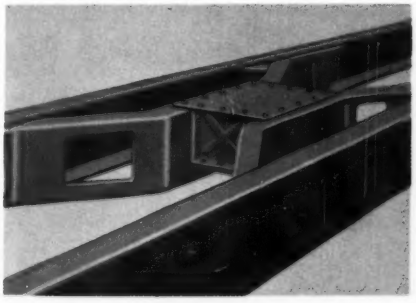
You can mount up to an 11-foot body on a 92-inch wheelbase, or practically *any* construction body on the new full line of GMC steel tilt-cabs. Turning circles are short as 33½ feet. Front vision is the best you can get. Payloads are bigger with front axle set back 52 inches. Full tilt of the 72" BBC cab cuts service time and costs. Choice of responsive V-6 and Twin-Six gas engines or new V-6 diesel.

Here is new, practical styling and uncompromising ruggedness...new GMC pickups with frames up to 100% stronger, V-6 power with 3 times longer life expectancy and stronger axles. There is extra stamina and extra value in every one of the 34 combinations, including "go anywhere" 4-wheel-drive models. Other 105" BBC Conventionals to 45,000 lbs. GCW. See them, drive them today.

the most advanced trucks in 20 years!



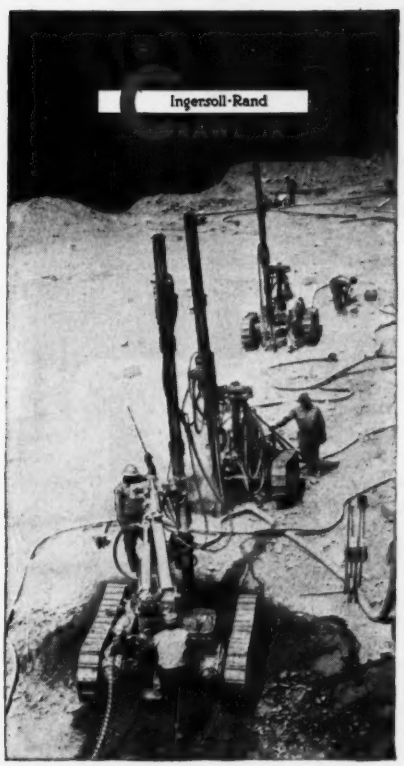
New GMC Double-Life Cabs! A man ouldn't stand this "shake test" for 0 seconds, yet new GMC cabs can ndure it for nearly two days . . . roof of superior construction and ong life on every job.



Frames Up to 35% Stronger! Totally new lesign, new stronger and lighter materials nake GMC Truck frames stand up under he constant tougher-than-normal con-ruction hauling, permit you to carry gger loads, too.

Longer Brake Life! You get cooler unning, stronger and longer last-ng brakes with GMC's new cen-rifuse drums . . . bigger lining reas give added lining life and quick, safe stops.

MC Truck & Coach—a General Motors Division—Pontiac, Michigan



RIGHT ON SCHEDULE

Gyro-Flo powered CRAWL-IR drills average 400 ft. daily in Westchester Granite with 3-inch Carset bits

These three Ingersoll-Rand CRAWL-IR drills, each powered by a 600-cfm Gyro-Flo compressor, helped a New England Contractor to stay right on schedule in removing a million yards of rock for the Elmsford Section of the Cross-Westchester Expressway. Drilling holes with 3" Carset bits, each machine has averaged about 400 ft per day in hard Westchester granite. All tower positioning is hydraulically controlled and 12′ 3" boom swing permits drilling on both sides of the crawlers at a single setting.

The 600-cfm Gyro-Flo rotary compressors offer maximum economy and dependability—smoother running, smaller, lighter, virtually maintenance-free, with air temperatures under 200°F, low oil consumption and closer regulation at all loads from 0 to 100% capacity. Gyro-Flo units are available in 6 sizes from 85 to 900-cfm, for every air-powered job.

Ask your I-R distributor or engineer for complete information on the cost-saving CRAWL-IR Gyro-Flo combination.

Ingersoll-Rand

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A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

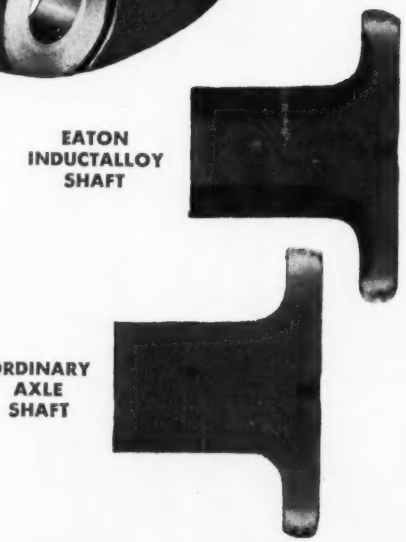
In New Trucks or Old—
EATON INDUCTALLOY AXLE SHAFTS

LAST 3 to 10 TIMES LONGER

Through billions of miles of heavy-duty service, Eaton Inductalloy Axle Shafts have proved their ability to deliver superior performance. Freedom from break-down—more time on the road, less time in the shop—plus thousands of trouble-free miles added to axle life, mean lower over-all operating cost.

Eaton's exclusive method of dual hardening truck axle shafts produces an extremely hard case extending deep into the material structure, and enables Inductalloy Axle Shafts to handle more work and abuse without fatigue failure.

Eaton Inductalloy Axle Shafts are available not only in new axle equipment, but also as replacements for earlier models. Ask your truck dealer for complete information.



EATON INDUCTALLOY SHAFT

ORDINARY AXLE SHAFT

EATON

AXLE DIVISION

MANUFACTURING COMPANY

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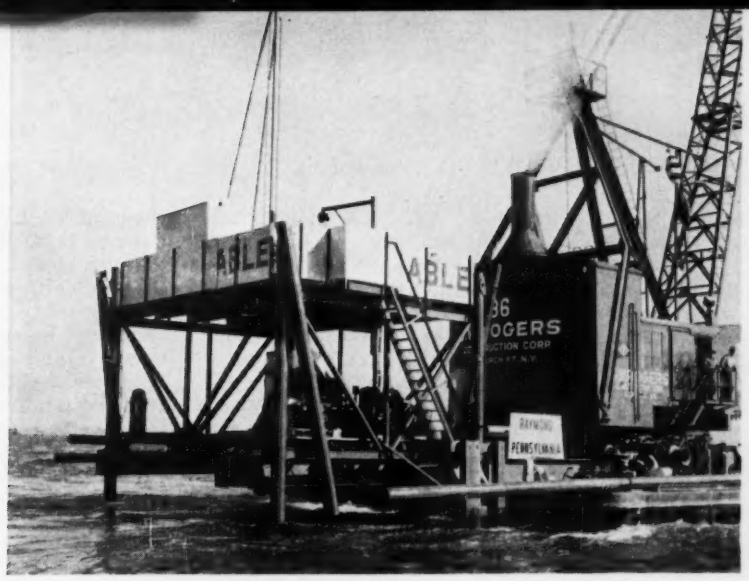


PLACING THE TOWER—Crane barge, carrying drill tower on pair of outriggers, maneuvers into position. One barge moves the three platforms to various drill sites.

Drill Towers Are Easy to Move

SETTING UP an offshore drilling operation in the middle of New York Harbor is the sort of thing that could easily get you involved in a major maritime traffic jam. If you have to do it, the best way to stay out of trouble is to design agile drill platforms that can move around quickly and provide a poor target for ships.

Raymond International, Inc., designed and built three such rigs for their contract to drill 20 test holes across New York Harbor. The holes, spaced 500 ft apart, will chart the bedrock along the proposed line of a $25-million water tunnel that the New York Board of Water Supply plans to build from Brooklyn to Staten Island. Raymond was in a joint venture with the Pennsylvania Drilling Co. of Pittsburgh to handle the exploratory borings.

Floating drill rigs were not feasible for this job for several reasons. One was the depth of the holes. The deepest was over 900 ft; that kind of drilling requires a solid drill platform. Another factor was the tide. Normal variation is 6 ft and the tide moves fast through New York Bay where the drilling took place. Finally, rough weather would have been a continual threat.

The drill platforms had to give firm support for the drills. But they also had to be easy to move.

DRIVING THE PILES—With platform on outriggers, crane drives piles through pipe sleeves. First platforms had four vertical sleeves. Later, two more were added.

READY TO DRILL—Platform has been raised and pin-connected to the piles.

Raymond put together a highly mobile setup consisting of three separate drill platforms. Each could be pinned firmly to the harbor floor with pipe piles. And a floating derrick with special outriggers could pick up a platform, pull the piles, and move the platform to the next location in a few hours.

Drill Platforms

Each of the three drill platforms was 20 ft wide, 25 ft long, and 40 ft high. Each weighed 27 tons when fully equipped. There were two decks; the steel mesh upper deck carried the drill equipment, and a timber lower deck carried the water tank and equipment for pumping drill mud into the hole.

At the four corners of the platform and at the mid-points of the two sides were 12-in. dia pipes or spud sleeves about 20 ft long. These sleeves guided the six piles that supported the platform during the drilling operation. Holes in the sleeves allowed the piles to be pin-connected to the sleeves for easy positioning and removal.

Slanting pipe sleeves were built onto the corners of the platforms to carry batter piles for extra stability. But these were not used.

The platforms were well

continued on next page

equipped with lights, flashing beacons, and ship-to-shore radio to warn passing ships of their presence. A Wallace & Tiernan foghorn operated when the visibility was bad. Each platform had a 1,500-watt Kohler, gas-operated generator set to supply electric power.

Raymond designed the platforms specially for this job. The Grand Iron Works in the Bronx built them. They were hauled to the drilling site on a floating crane barge operated by Geo. W. Rogers Construction Corp.

Handling the Platforms

The crane barge mounted special outriggers to carry the drill platforms. The outriggers consisted of two 24WF110 beams that extended 25 ft over the stern of the barge. Stiffener plates were welded between the flanges at the quarter points and at the ends.

To place a platform, the derrick barge maneuvered into position with four corner anchors powered by a 150-hp steam winch on deck. Then the crane, a 40-ton capacity Wiley Whirley with a 125-ft boom, picked up the pipe piles for the corners and dropped them through the sleeves.

The piles were 8 in. dia and about 130 ft long. The crane drove them with a McKiernan-Terry 9B3 steam hammer. When the four piles were in place, the crane lifted the platform up on the piles until it was 6 ft above high water mark. There a crew pin-connected it to the piles. The crane released its hold and the barge backed out from under the platform.

Drilling

A Joy No. 22 drill rig, using various sizes of roller bits, bored through the silt to bed rock. The walls of the hole were supported with drilling mud until steel casings could be dropped in. Mud was Aquajell and Zell brands, mixed with salt water in an 800-gal tank. Size of the casing varied from 4 to 8 in. dia.

Then rock drills took over and extracted core samples down to the required depth. Drill rod sections were 20 ft long.

Under good working conditions, the crew drilled and cased 70 ft through silt in an 8-hr shift. The deepest of the holes (914 ft) took about eight days of three-shift operation to complete. About 725 ft of the depth was through rock.

After the core drills had taken their samples, and before the casing was removed, the crew grouted in each hole for the full depth. This was to prevent leaks from developing during the tunneling operation in the future.

Crews worked around the clock, seven days a week, to finish the job in good weather. They finished in 42 days, 10 days less than the estimate. But in spite of the fast pace, there were no accidents during the entire job.

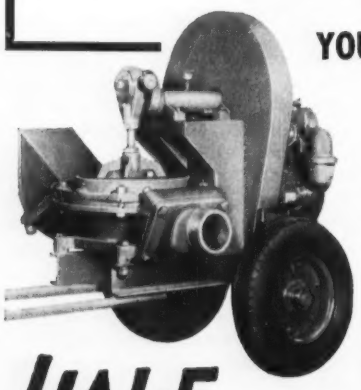
For the joint venture, Charles Mergentime was project manager, Robert Ficarra was project superintendent, and Harlan Gollihue was drilling superintendent. Meyer Barkin was division engineer for the New York Board of Water Supply.

De-water faster, easier...cut "down time," too!

with **HALE** **Contractor's Pumps**

Now you can pick the pump that serves your purpose best! No matter what your de-watering problem may be (drainage, springs, surface water, flooding) or where it may be (man holes, excavations, cellars, ditches, etc.), there's a Hale pump to handle it and at the lowest possible cost. Here's why!

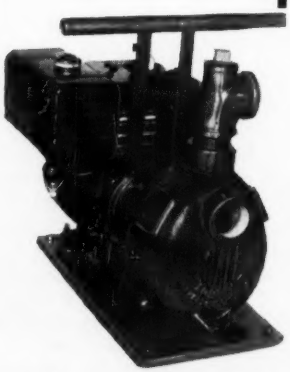
Hale offers you the "Torrent" line for moving high volumes of water fast. Capacities from 4,000 to 20,000 G.P.H. Or, for constant control of seepage and high-solid-content water, there's the Hale Diaphragm Line. Capacities from 2,500 to 8,000 G.P.H.



YOU CAN'T FIND A BETTER SELECTION nor SELECT A BETTER PUMP!

Diaphragm Type 40DP, 4" Pumps 8,000 G.P.H. Also Type 30DP, 3"; 20DP, 2"; 15DP, 1½"

"Torrent" 25-T, 2" Pumps 10,000 G.P.H. Also 30-T, 3"; 20-T, 2"; 15-T, 1½"



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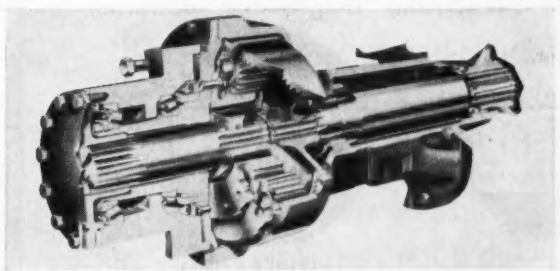
HALE . . . manufacturers of custom designed equipment for industrial and contractors' use

It's a real lugger!

...new International® 660 Diesel

Put the 660's 74 drawbar hp* to work and free your big earthmoving tractors for larger, more profitable assignments! The new, direct-start, smooth-running six-cylinder Diesel delivers *more than 11,000 pounds of pull*, with adequate weight for traction.

Over 4½ tons of built-in brawn give the 660 the stamina for continuous heavy-duty operation. Yet, with power steering, operators handle this giant tractor with single-handed ease. Equipped with optional Torque Amplifier drive, the powerful 660 provides 10 speeds forward, 1.5 to 16.5 mph. In any gear, a touch on the TA foot control lets the operator boost pull-power up to 45%, *on-the-go*, without shifting...Also available with Multi-Range, 6-cylinder gasoline or LPG engine.



First new big tractor drive in 10 years!

A new and exclusive planetary gear system makes the final speed reduction at the wheel hub . . . axles are completely free-floating. Thus, tractor weight, shock loads from uneven terrain, and heavy drawbar pulls are carried by the hefty final drive housings, *not on the axles.*

Take a good look at your equipment fleet and add up the number of jobs you could handle more economically with the International 660's rubber-tired speed and lower operating costs. Then, visit your International Harvester dealer, headquarters for the construction industry's most complete line of tractors . . . six power sizes on wheels, 13.4 to 95 maximum flywheel hp*. Ask for a demonstration of the tractor to match your needs.

**Corrected to standard sea level conditions.*

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International Harvester Products *pay for themselves in use*—Farm Tractors and Equipment . . . Twine . . . Industrial Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois.

Champion "Plug-Scope" cuts spark plugs right in the engine

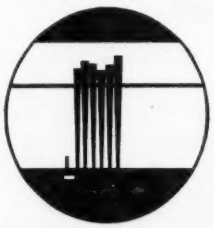
Simple operation and easy-to-read patterns on the Champion "Plug-Scope" make spark plug checking as easy as watching TV!

With just four fast connections—to battery terminals, distributor or coil, and any spark plug cable—the Champion "Plug-Scope" is hooked up and ready to go.

Then, you accelerate the engine and release immediately, watching the red warning line on the "Plug-Scope" screen. If traces rise above the line, plugs need attention. It's that simple!

Here's how easy it is to read "Plug-Scope" patterns

SATISFACTORY SPARK PLUGS
(Traces below warning line)

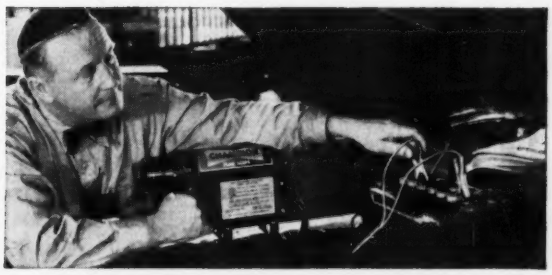


UNSATISFACTORY SPARK PLUGS
(Traces above warning line)

CHAMPION SPARK PLUG COMPANY

maintenance costs by checking —in less than 60 seconds!

Here's how Champion's new portable oscilloscope can reduce your maintenance costs by electronically checking spark plugs and helping track down common ignition problems faster . . .



"Plug-Scope" saves time by electronically checking spark plugs right in the engine. It takes less than 60 seconds to hook up the "Plug-Scope" and check a complete set of spark plugs. And the "Plug-Scope" is so easy to operate that anyone in your shop can use it, relieving experienced mechanics for tougher jobs.

"Plug-Scope" helps track down common ignition problems faster. Instruction manual tells how the "Plug-Scope" can be used to determine available ignition voltage, discover reversed coil polarity, and detect internal, hidden breaks in spark plug cables. It saves time and labor "trouble shooting."

"Plug-Scope" is portable, can be used anywhere in your shop or out on emergency road calls. Powered by the vehicle's battery, the "Plug-Scope" can be put to work instantly anywhere. On road calls, the "Plug-Scope" helps get vehicles back in operation faster by showing right away whether or not trouble lies within the ignition system.

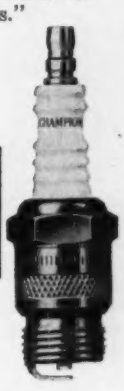
"Plug-Scope" double-checks preventive maintenance—helps avoid costly, unscheduled "returns." You can use the "Plug-Scope" during preventive maintenance to make sure ignition voltage is up to par, spark plugs are in good condition, polarity isn't reversed and cables don't have hidden breaks. It helps cut costs by reducing vehicle "returns."

See for yourself how a Champion "Plug-Scope" can save time, reduce maintenance costs and improve engine performance for your fleet. Ask your Champion supplier for a "Plug-Scope" demonstration right away!

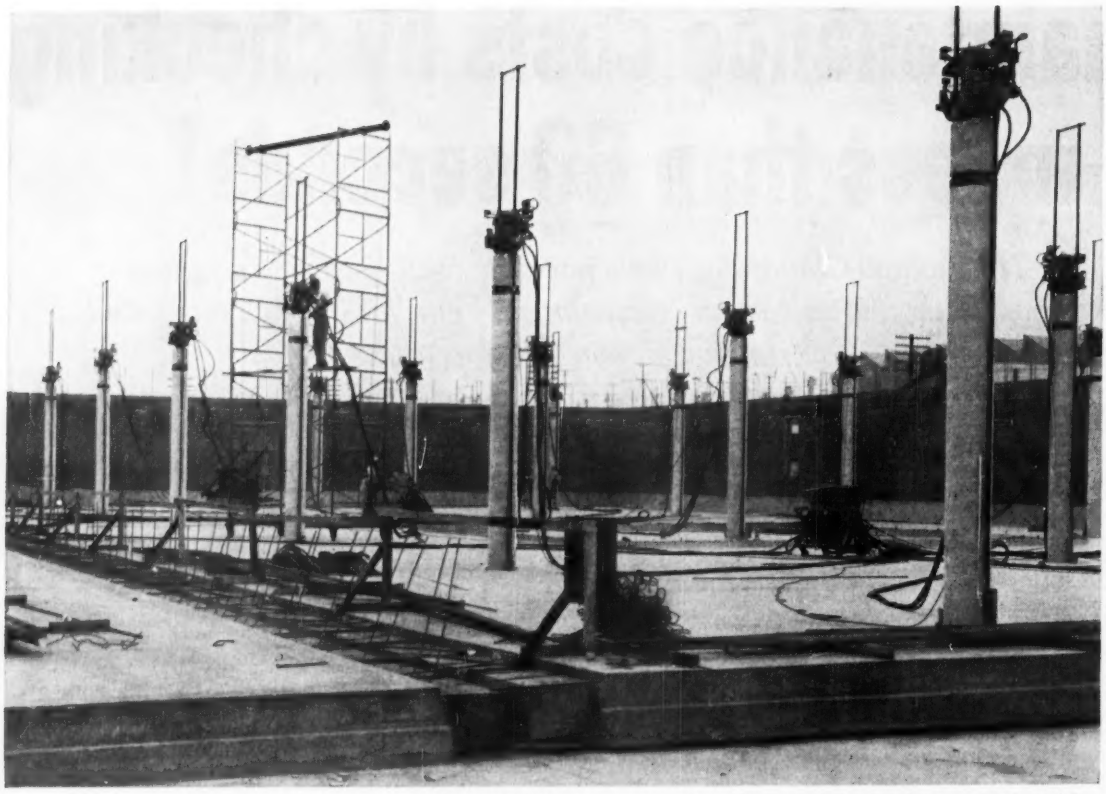
DEPENDABLE

CHAMPION

SPARK PLUGS



TOLEDO 1, OHIO



LIFT BEGINS—With wall already in place, hydraulic jacks begin to lift first of four 1,000-ton roof slabs. It takes 18 precast columns to support each 21,780-sq-ft slab.

Bricklayers Erect the Walls

HEAD START—Masons lay non-load-bearing brick wall around perimeter of building. By working on walls and slabs at same time, contractor cut schedule five to six weeks.

ROOF AND WALLS went up at the same time on this lift-slab job. The contractor realized major economies by laying a non-load-bearing brick wall around the perimeter of a one-story industrial building while the concrete roof slabs were being poured.

Customarily, the walls are built after the roof is jacked into place. But Bibb, Remmen, and Bibb, general contractors of Los Angeles, cut costs and chopped five to six weeks off their schedule by handling these two operations simultaneously during the construction of a $1,300,000 structure in Glendale, Calif.

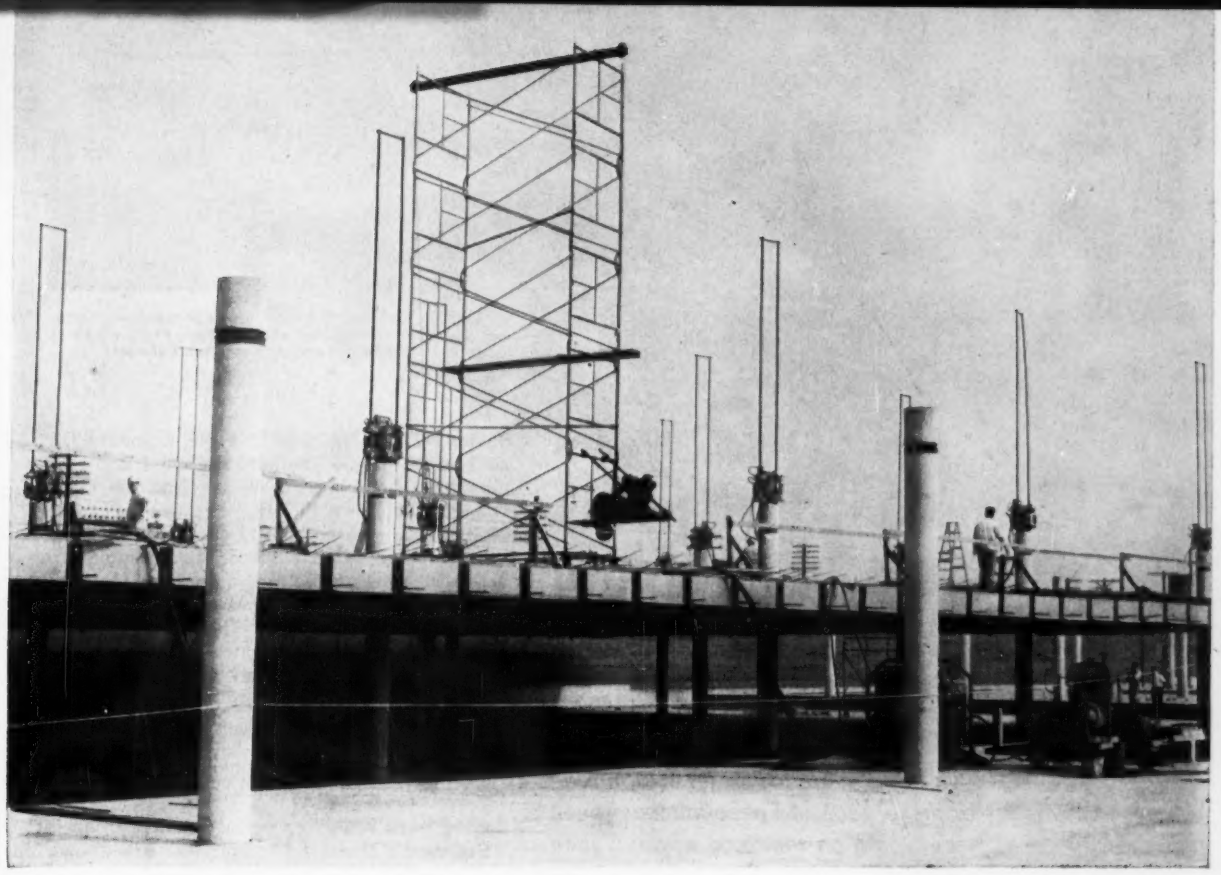
The roof consists of four concrete slabs, each weighing 1,000 tons and measuring 21,780 sq ft. These massive sections are supported entirely by precast concrete columns.

Each column is cast with eight vertical bars of No. 8 reinforcing steel in the outer cage and four bars in the inner cage. A horizontal steel ring that will serve in supporting the roof slab later on is welded to the outer cage near the top of the column.

It takes 18 columns, 16 in. in dia, to support each roof section. A Champ No. 200 fork-lift truck with a 20-ft lift and 3,600-lb capacity, erected each column on top of a foundation caisson so that two steel plates, one embedded in the caisson and the other in the bottom of the column, were matched for bolting. Four bolts connected the plates, and an adjustable leveling nut aligned the columns until they were plumb. Between the caisson and the column there is a 2-in. dry pack of sand and cement.

Pouring the slabs began after the columns were erected. The roof slab is 18½ in. thick and of waffle design. It was cast on the cured floor slab over a web of reinforcing steel and corrugated cardboard box forms.

Vagtborg Lift Slab Corp., Los Angeles, handled the entire lifting operation with 75-ton capaci-



SLAB GOES UP—Scaffold rides up with the roof slab. Winch, mounted on one side of the scaffold, hoists jacks to the top of columns. Later, it will lower them again.

While Masons Pour the Roof

ty hydraulic jacks of their own design. A winch mounted on a rolling scaffold hoisted a jack into position on top of each column. The scaffold rode up with the roof to lower the jack after the slab was secured.

The lifting force of each jack was transmitted to the slab by two threaded steel rods—one on each side of the column — that were attached to a steel collar cast in the slab around the column opening. Two consoles controlled hydraulic pressure. When the pressure was on, the jack, pushing up against a yoke, raised the rods and the slab at the rate of 1¾ in. per min.

Two chain belt mechanisms rigged on each jack controlled two seperate pairs of locking nuts on the rods. While the jack was extended, the mechanism locked the upper pair of nuts to raise the slab. While the jack was retracting, it locked the bottom pair of nuts to hold the slab firmly in place.

Vagtborg raised the entire roof to a height of 15 ft in eight days. When the steel column ring appeared on the underside of the slab, the lifting operation came to an end and the job of securing the slab permanently in place began.

Two-man teams wrestled semicirucular steel collars around the column rings and locked them together. Welding the collars to the column rings and to steel plates embedded in the underside of the slab made the roof, columns, and caissons an integral unit.

The contractor poured concrete to join the roof and walls and knit together the roof sections. They also filled with concrete a 2-in. space between the top of the column and the top surface of the roof.

The building is owned by Librascope, Inc., a division of General Precision Equipment Corp. It is designed so that the roof can be used for an employee parking field.

SECURING THE ROOF — Workmen wrestle a semicircular steel collar around column ring. Collar is then welded to ring and steel plate on underside of roof slab.

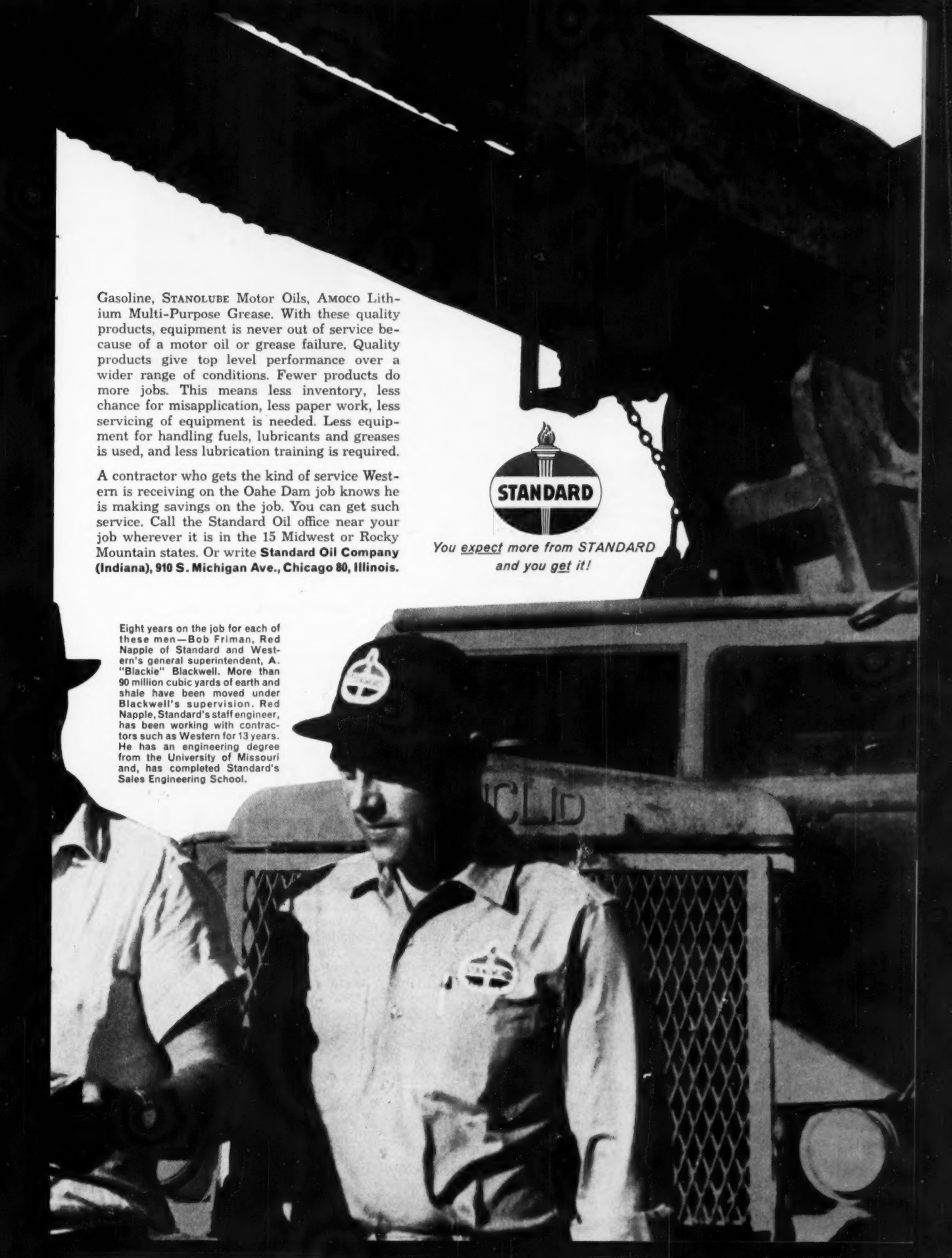
Multi-million dollar picture. Here is part of Western's equipment lined up for inspection at Oahe Dam. Photo shows 86 trucks, 23 bulldozers and crawler pieces and 9 scrapers.

2 ways Standard Oil helps Western Contracting Corporation save on Oahe Dam job

In eight years on project, 10 million gallons of diesel fuel and gasoline have been delivered on time and when needed

Saving No. 1 F. L. "Red" Napple, Standard Oil staff engineer, and Standard Oil agent Bob Friman have been serving Western on the Oahe Dam project since the first dirt was moved in 1952. This means continuity of service that can be invaluable to a contractor. Red Napple has an engineering degree plus more than 13 years' experience in just this kind of work. Western thus has the equivalent of another engineer helping them. Napple is located at Aberdeen and Friman at Pierre, both only a few miles from the job. Western works around the clock. So does Standard. Bob Friman and his men make deliveries 24 hours a day, winter and summer. Western never has equipment down while waiting for deliveries of fuels, lubricants or greases.

Saving No. 2 Western uses only quality products —Standard's Diesel Fuel, STANDARD RED CROWN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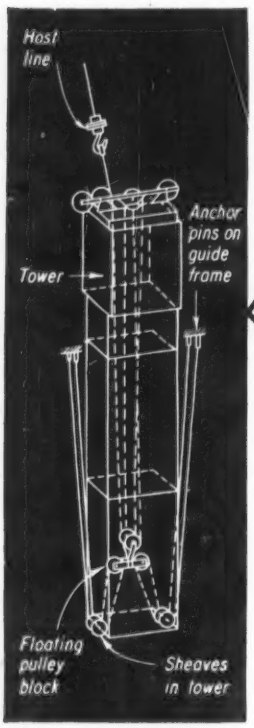
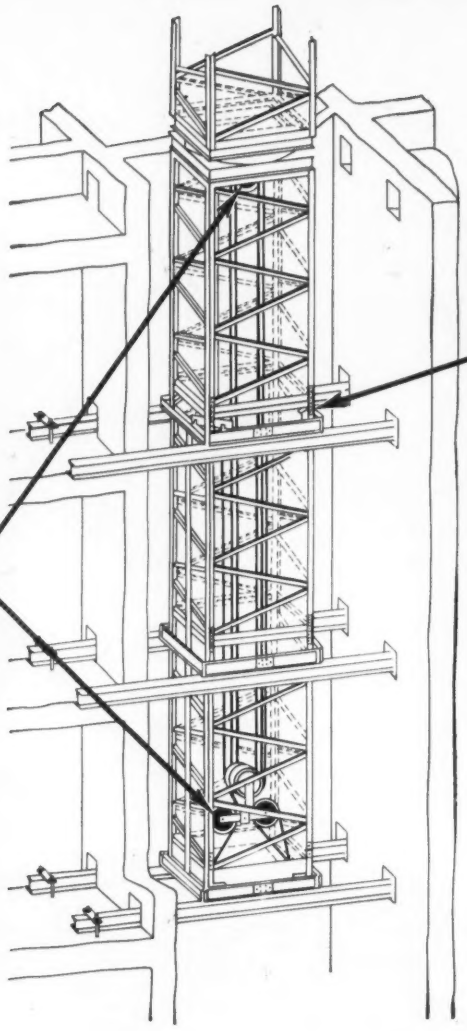
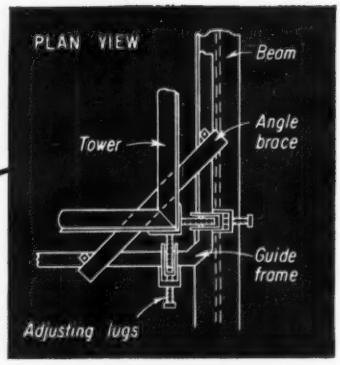
A contractor who gets the kind of service Western is receiving on the Oahe Dam job knows he is making savings on the job. You can get such service. Call the Standard Oil office near your job wherever it is in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**
Eight years on the job for each of these men—Bob Friman, Red Napple of Standard and Western's general superintendent, A. "Blackie" Blackwell. More than 90 million cubic yards of earth and shale have been moved under Blackwell's supervision. Red Napple, Standard's staff engineer, has been working with contractors such as Western for 13 years. He has an engineering degree from the University of Missouri and, has completed Standard's Sales Engineering School.



HOW IT CLIMBS—Crane lifts itself by hooking its own hoist line to cables reeved through floating block and sheaves in base of tower. Ends of cable are anchored to pins on a guide frame.





TOWER BRACING—Guide frame rests on top of WF beam that extends across elevator shaft. Angle brace takes weight of tower and crane, and adjusting lugs keep the tower plumb.

HOW IT LOOKS — Tower rises through elevator shaft and is braced at three consecutive floors. During hoisting operation, adjusting lugs are loosened, angle braces removed.

Crane Climbs Up a Shaft As Building Rises Around It

A CLIMBING CRANE that stays on top of the work by raising itself up through an elevator shaft by its bootstraps is making its debut in the United States. It is pouring concrete and hoisting other materials for a 15-story reinforced concrete building in Wilmington, Del.

The crane is a Universal-Liebherr Model 50HB, manufactured in West Germany. Venite of Delaware, a subsidiary of Keystone Concrete Co. of Conshohocken, Pa., is the concrete subcontractor operating the crane.

"We picked this crane," says John McGrath, Venite's general superintendent, "because we're hard pressed for working space. We couldn't get permission to move truck cranes in on the empty lot behind the building. And we didn't think the city would let us work off the street."

The crane consists of turntable, motor section, gantry, and boom. It is mounted on top of a tower that is secured to three consecutive floors at the elevator shaft. The tower protrudes far enough above the elevator shaft to provide clearance for the construction of two floors. When these are completed, the crane moves itself upward to work on the next two floors.

The crane's tower is braced to the floors by guide frames that fit snugly around it. The guide frame consists of a square collar made from steel channels. It rests on top of, and is bolted to, two parallel 8x8-in. WF beams that extend across the elevator shaft. The beams are wedged through opposite walls of the shaft. And they are blocked in place against lateral movement.

The weight of the tower and crane is taken by removable angle bars that extend across the corners of the guide frames and under horizontal members of the tower. The tower is kept plumb by threaded adjusting lugs that pass through the corners of the

guide frame and tighten against the columns of the tower.

Here's how the crane and tower climb through the shaft. In effect, the crane's regular hoist mechanism, through cables running down around sheaves in the bottom of the tower and back up to the building frame, lifts the assembly by its bootstraps.

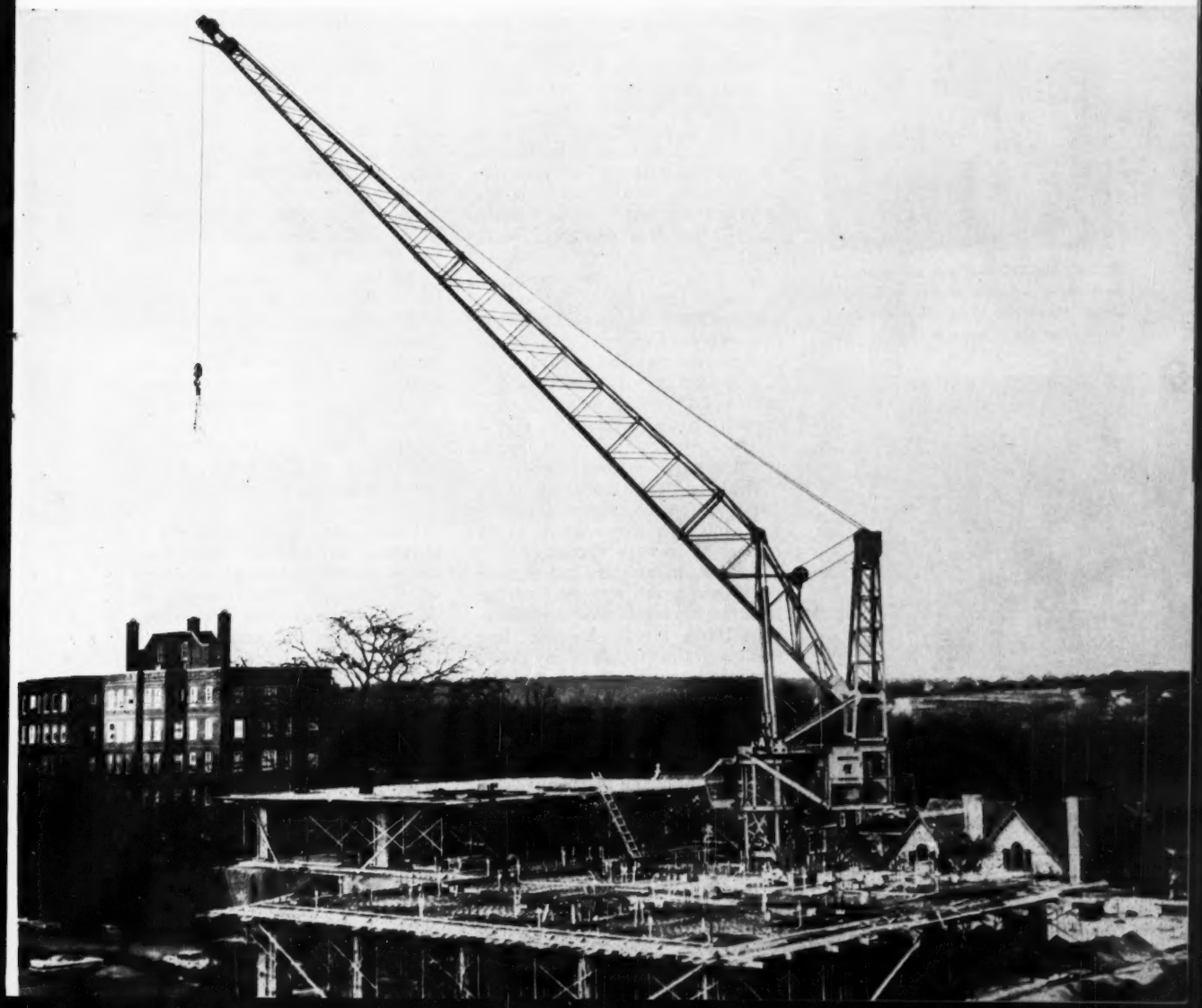
But the actual procedure is not that simple, and it takes about 1 hr. First, the crane boom is raised to a nearly vertical position. The hook on the hoisting cable is slipped through the eye of another cable that is reeved through a floating pulley block. The pulley block has four sheaves, and it hangs inside and near the bottom of the tower. The cable forms a four-part line, passing through two sheaves in the upper part of the pulley block and another sheave at the top of the tower. It is dead-ended at the tower top.

Two additional cables are reeved through the lower two sheaves in the floating block and through two pairs of sheaves at the base of the tower. The four loose ends are secured to anchor pins on the uppermost guide frame, which serves as a deadman. This tackle arrangement multiplies pull on the crane's hoist line 32 times.

The operator takes up on the hoisting cable to put tension on the tackle. The adjusting lugs are loosened and angle bars removed. Then the entire crane and its attached tower are raised by its own hoist gear. A new guide frame is placed around the tower on the top floor. The tower is made plumb with the adjusting lugs, and the angle bars are inserted. The operator slacks off on the cable and the tower is supported in its new position. The lower guide frame is dismantled and moved to the floor where it will be needed next.

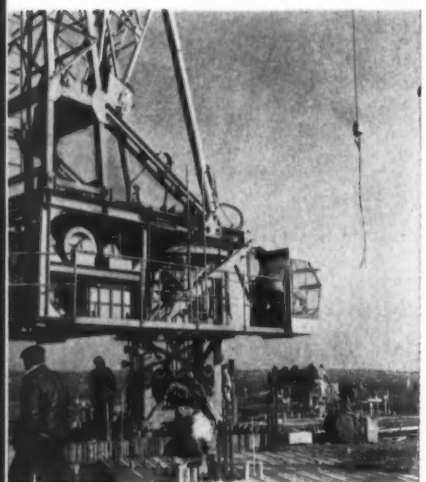
At the start of the job, Venite erected the crane and tower with the help of a P&H truck crane that is also working at the site. Once it was erected, they guyed the tower with four cables until

UP ON TOP—Crane with 98-ft boom works on top of reinforced concrete building. It rests on top of tower that rises through elevator shaft. With its own hoist gear, crane can lift itself two floors in about 1 hr.



FIRST STEP—Motor section, lifted by another crane, goes up first after tower is guyed.

BOOM SECTION—Truck crane working from the street lifts section of climbing crane's boom into place. Gantry and motor section are already at top of tower.



COMPLETED CRANE—Cab extends well out in front and catwalk runs around the entire motor section. Crane and tower are now secured to three floors at shaft.

Assembling Crane on Tower

they completed the first three floors of the building.

It is possible to handle the erection of the crane in a different way. The crane first is seated on a concrete pad. Then it lifts a tower section by a hoist cable reeved through a pair of sheaves about one-third of the way out on its boom. When the boom is raised to an 80 degree angle, the tower section is directly over a hole in the turntable. Lowered through the hole, the tower section is anchored on the concrete pad. Then, with a tackle arrangement somewhat similar to the one used in the elevator shaft, the crane climbs to the top of the tower. The process of adding on a tower section and climbing to its top is repeated until the crane reaches desired height.

Once erected, the crane works in the center of the building over the elevator shaft. The crane has pushbutton controls that enable the operator to slew, hoist, and luff at the same time. It has a level-luffing feature; it can boom up or down without changing the height of the load. And the boom is luffed by two long hydraulic rams rather than by boom hoist cables.

It's a light-capacity crane, but it won't overload. The motor shuts off automatically when it picks up too much weight. At 80 degrees, the boom has a maximum lifting capacity of 8,800 lb and a radius of 11 ft 6 in. At 15 degrees, capacity drops to 3,680 lb and a 98 ft 3 in. radius. The crane, itself, weighs 30 tons.

It slews at 0.8 rpm. It has a maximum hoisting speed of 490 fpm, but this slows down to 65 fpm as it reaches capacity.

At the maximum radius, the boom can reach any part of the Wilmington building which measures 100 x 110 ft. Its hoist line can reach the ground at any point, so transit-mix trucks can pull off the road at any convenient place. Materials are stockpiled wherever there is room.

The crane's cab extends well out in front of the platform. From this vantage point, the crane operator can see everything that goes on once the hook appears over the edge of the building.

It's still too early to get complete results on the crane's performance at Wilmington. But, so far, McGrath is pleased with production. "During the first month we poured about 1 2/3 floors a week," he says. "Now that our operator is getting used to handling the crane, we expect to average two floors per week."

Each floor is 11,000 sq ft and requires 170 cu yd of concrete. McGrath figures he is getting better production with the crane and a 1-yd concrete bucket than he could hope for with hoist tower, runways, and buggies. Besides, it takes only one man to operate the crane.

Robert Purnell, crane operator, was trained for the job by Universal-Liebherr. Venite selected him from their work force even though he never had operated a crane before. Joe Fortin, technician for Universal-Liebherr, says he prefers to train a man with no previous crane experience. "That way he doesn't have too much to unlearn."

Purnell says there is a slight sway in the cab when the wind is strong. But the crane has remarkable stability considering that most of the weight is at the top of the tower.

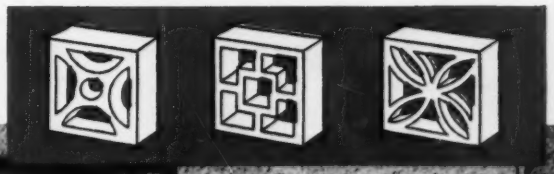
Getting the crane down once the building is completed takes a little ingenuity. Utilizing its own power, the crane can dismantle those sections that will not fit back down through the elevator shaft. These sections are then lowered to the ground by a breast derrick erected on the side of the building roof. The tower can be lowered through the elevator shaft.

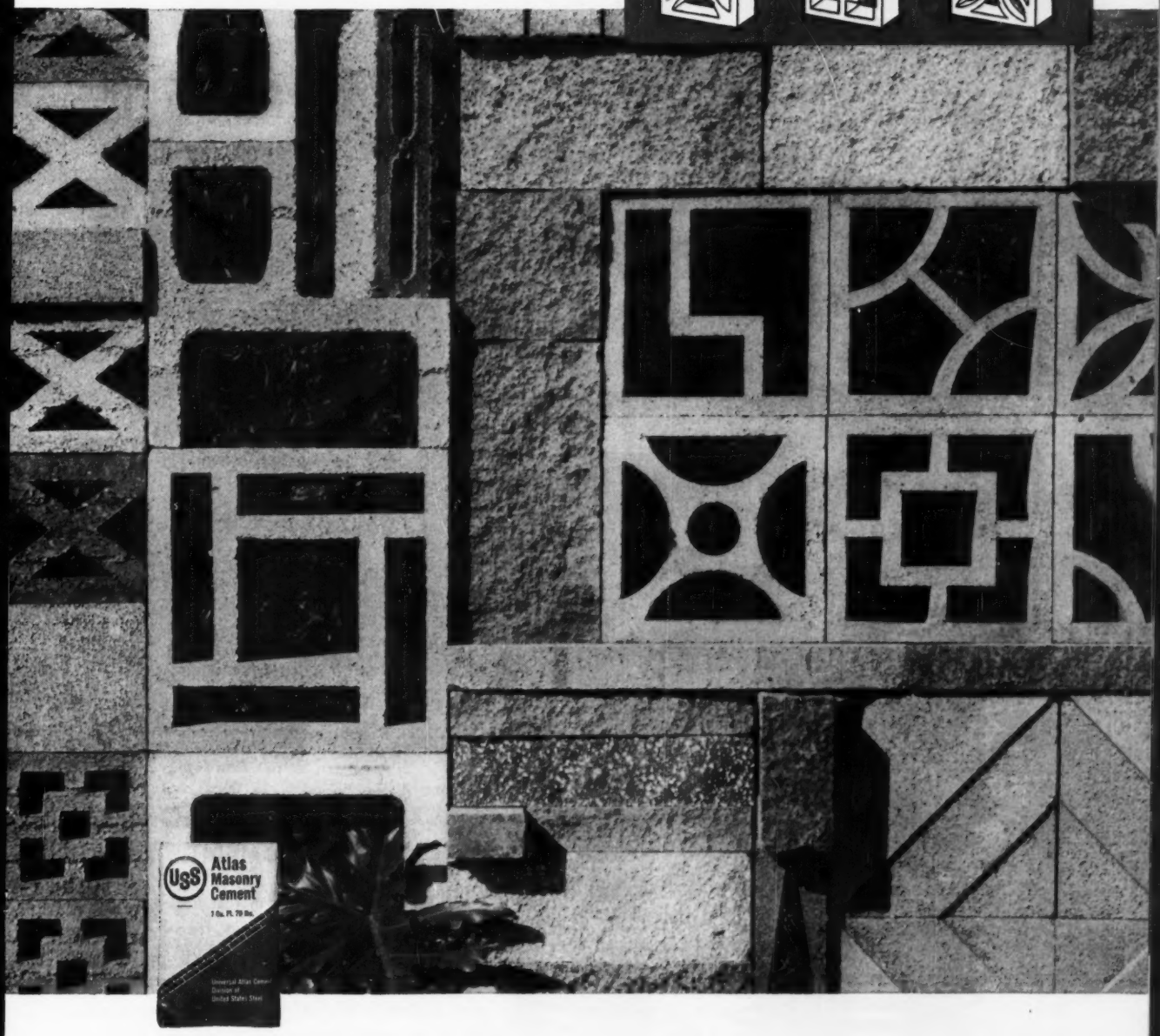
Venite leased the crane on a purchase option plan from Universal-Liebherr, Inc., a subsidiary of Universal Mfg. Corp. of Zelienople, Pa., sales agents for the crane in this country. The crane is manufactured by H. Liebherr in Biberach/Riss, West Germany.

Men on the Job

The structure in Wilmington is an apartment building. E. J. Frankel of Philadelphia is the general contractor. Paul Good is superintendent for Frankel. Jack Lewis is field superintendent for Venite.

Great new things are shaping up in concrete block





Atlas Masonry Cement measures up to the new masonry

whose range of patterns, shapes and textures is suggested in this block grouping by Architects D. Wallace Benton and Donald G. Park of Los Angeles. To lay up these striking new concrete block, Atlas Masonry Cement continues to be the preferred cementing material for mortar. It provides a smooth, workable mortar, assures a stronger bond, gives weathertight joints that are uniform in color. And Atlas Masonry Cement complies fully with ASTM and Federal Specifications. For information write: Universal Atlas Cement, Dept. M, 100 Park Avenue, New York 17, N. Y.

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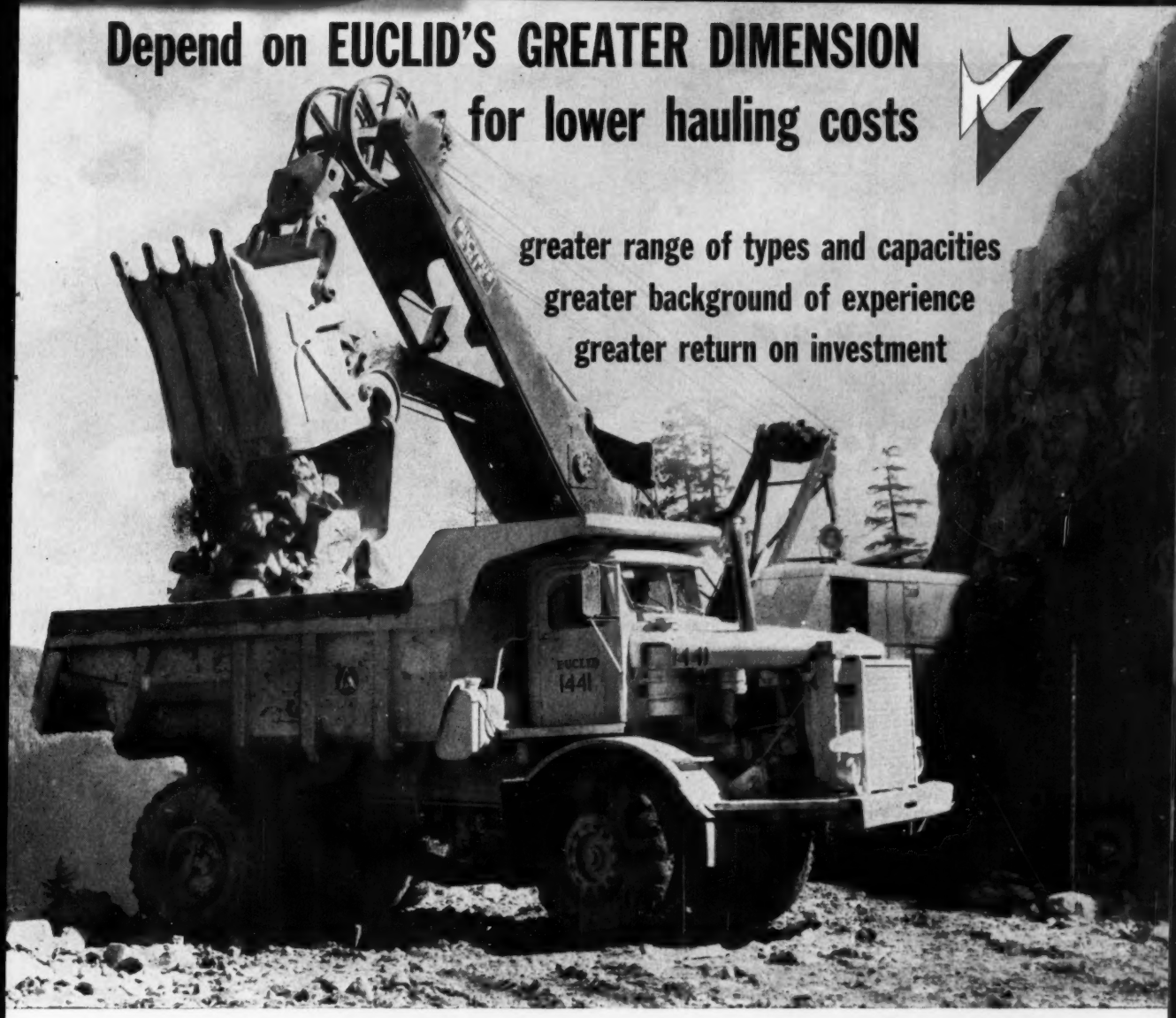

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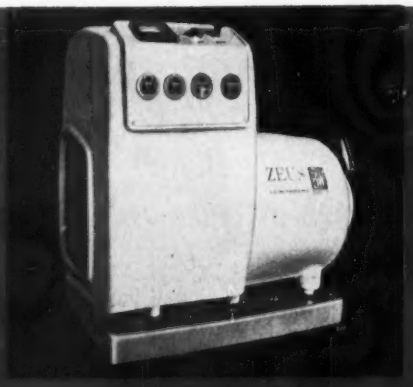

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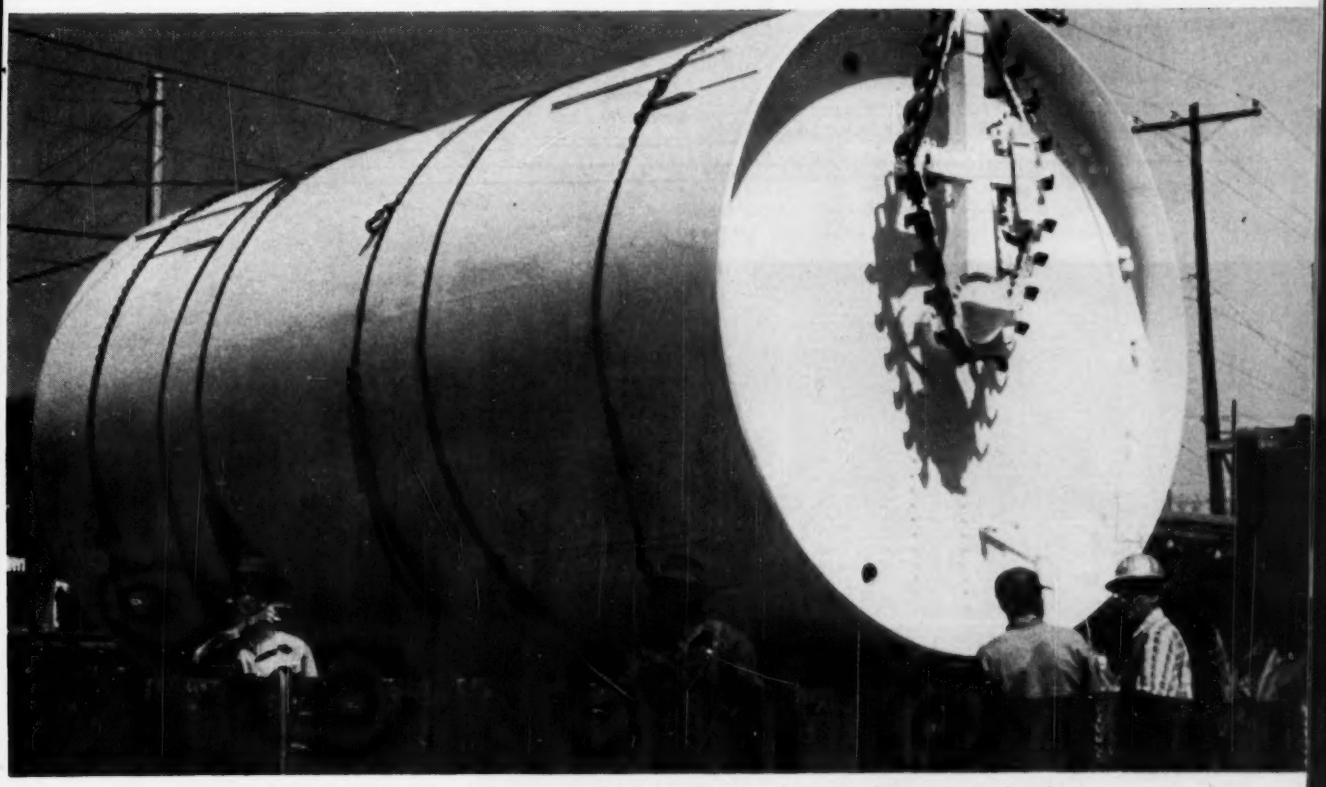
Unusual Tunneling Machine Cuts and Lines Storm Sewer



THE TEREDO The shell carries all power equipment and controls. Cutters are mounted on a rotating arm in front of the bulkhead. Water is mixed with the cuttings and pumped out as slurry through holes in the bulkhead.

The cutting equipment and the mucking method distinguish this tunneling machine from others. The machine's shell also serves as the outside form for the concrete lining.

A GAMBLE on an untried tunneling machine is paying off on a storm sewer job in Houston, Tex. The device bores the tunnel and also doubles as a slipform for the concrete lining.

Elmer C. Gardner, owner of a construction firm in Houston, designed and built the tunneling tool. Placing his confidence in the machine, he landed the contract for a 3,500-ft storm drain at a price of $490,000—about 30% under the next lowest bid.

And the machine is living up to his expectations. It is making steady progress of about 18 to 20 ft per day and leaving behind it a 10-ft-dia tunnel lined with a 9-in. concrete wall 30 ft under ground.

The cutting equipment and the mucking method are the two features that distinguish this machine from most other tunneling tools. Cutters that bite into the tunnel face are mounted on an arm that rotates about the axis of the tunnel; spoil is pumped out. The mucking method gives the tool its name—the Teredo. Its namesake is a shipworm that bores through wood, flushing fresh sea water into its hole and expelling waste.

To remove the spoil, city water is pumped into the space between the machine's bulkhead and the tunnel face through two 4-in. openings in the bulkhead. The water is maintained at a depth of about 5 ft. Cuttings drop into the water, and the resulting slush is pumped out through a 6-in. opening in the bulkhead.

Soil along the route consists of slabs and chunks of joint clay and some limestone. The cutting mechanism handles this material with no trouble, but most likely a new cutter design would be necessary if more rock were encountered.

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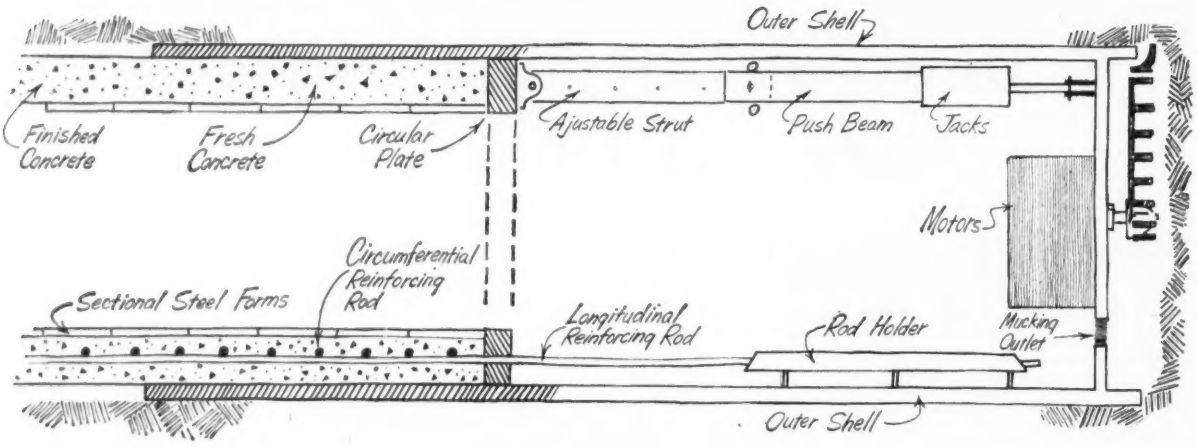
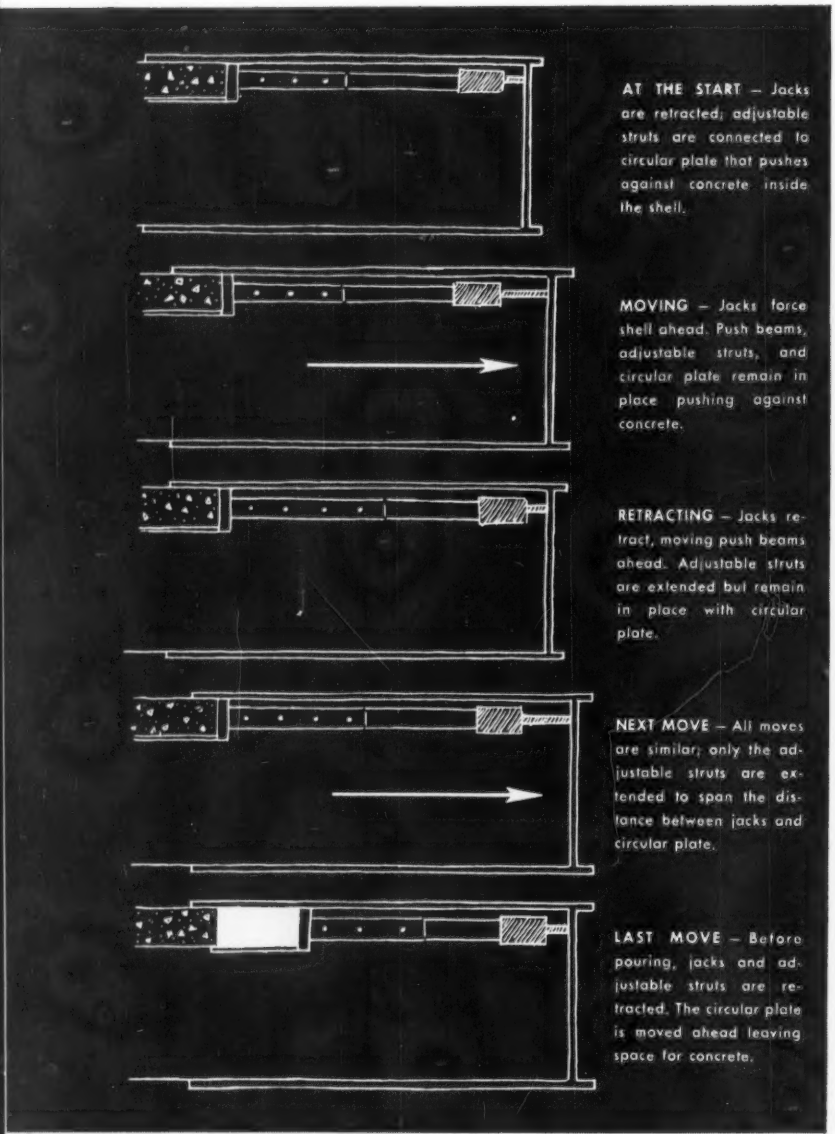




The Machine

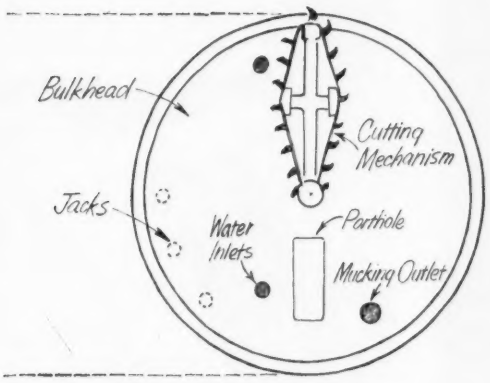
The 29-ft-long Teredo is an 11½-ft-dia cylindrical shell built in three sections. The shell in the 3-ft-long nose section is 1 in. thick and extends beyond the front of the bulkhead to serve as a cutting edge. The mid-section is 16-ft long and is built of ⅜-in.- thick steel plate. It is reinforced internally with rings of 2-in. structural angles on 12-in. centers.

The trailing end is 10 ft long with a ¾-in. shell. This portion of the tool serves as the outside form for the concrete lining. The trailing end and most of the mid-section are open and accessible to work crews. Equipment and controls for the machine's operation are located in the mid-section and the nose.

Five electric motors power the Teredo. A 30-hp electric motor drives a hydraulic motor that powers the cutting mechanism. A similar set up with a 10-hp electric motor rotates the cutting arm. Another 30-hp motor operates a Robbins & Myers Moyno pump that handles mucking. The pump weighs 1,622 lb and has a flow rate of 84 gal per 100 revolutions. Two 2-hp motors operate the hydraulic jacks that propel the Teredo—each powers a hydraulic pump, one to extend the rams and one to retract the jacks at the end of the strokes.

Jacking Mechanism

Eighteen 25-ton hydraulic jacks, built in Gardner's shop, propel the machine. Their thrust is carried back to the previously poured concrete tunnel lining



JACKING MECHANISM—Eighteen 25-ton hydraulic jacks are attached to the inside of the shell and connected to push beams. Hydraulic pressure against the push beams, forces the shell ahead as the tunnel face is cut away.

through a series of push beams and adjustable struts.

The hydraulic cylinders for the jacks are attached to the shell and spaced evenly around the cylinder in the nose section. Each jack is bolted to an 11-ft-long steel push beam. The other end of the push beam rides between two small flanged rollers that hold the push beam in place yet allow it to slide longitudinally.

At the end of each beam is an 8-ft long adjustable strut that can be pin connected to the push beam at various points along the strut. At the tail end, all adjustable struts frame into a circumferential ring bulkhead of steel plate. The plate is 11½ ft in dia and about 9 in. wide. This plate, or movable bulkhead, pushes against the fresh concrete tunnel lining and moves the Teredo ahead until it has advanced a sufficient distance for the next section of lining to be poured.

The hydraulic jacks have a stroke of only 2 ft. To permit longer pours, the pin connection between adjustable strut and push beam is moved ahead 2 ft after the jacks are retracted at the end of each stroke. The machine moves ahead in 2-ft strides until it covers enough distance to permit pours 6 to 8 ft long. Then it is stopped, the bulkhead moved ahead, the lining concrete is placed, and the boring resumed.

The Teredo's shell itself acts as the outer form for the concrete tunnel lining. Sectional forms for the inside liner are locked into place manually. Reinforcing steel is tied just before the inside forms are put in place.

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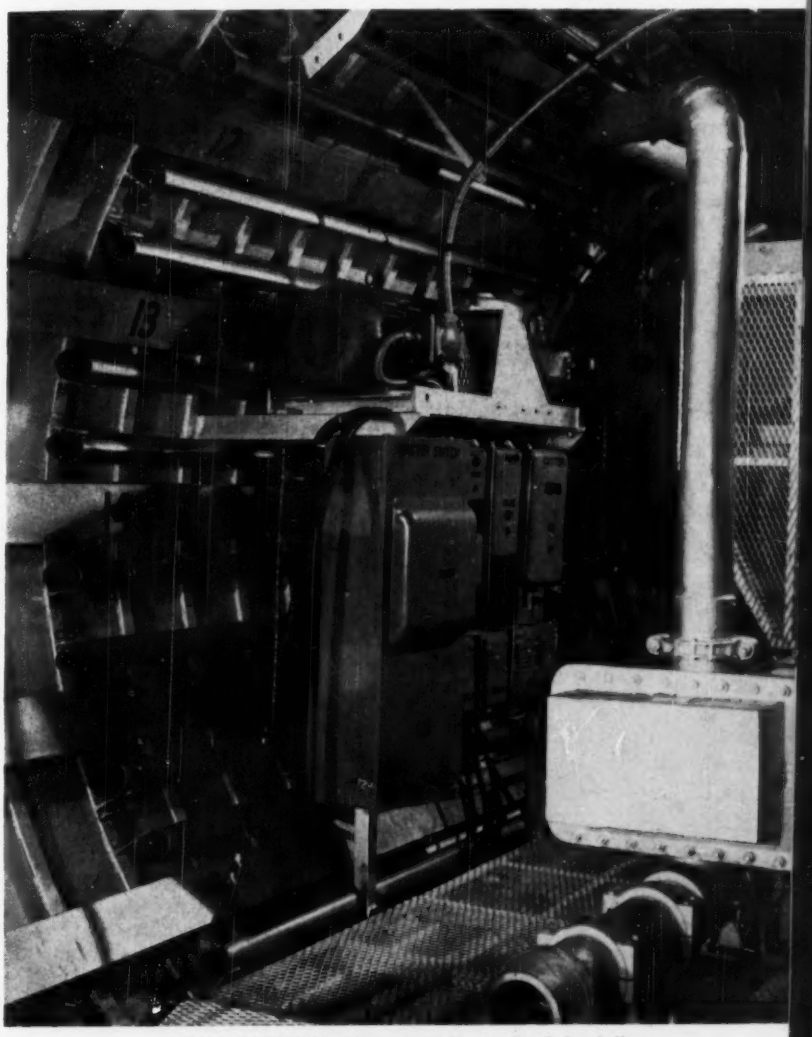


REBAR SUPPORTS—Pipes around the inside of the shell hold longitudinal steel. The rods are inserted into holders and remain stationary as the shell advances. Numbered beams between pairs of pipes are the push beams.

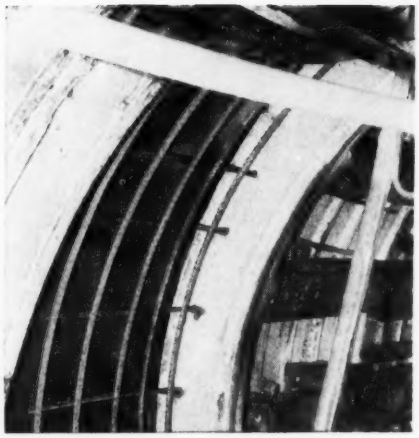
Machine Spaces Longitudinal Steel Automatically

Longitudinal steel fits through holes in the movable bulkhead and is connected in an 18-in. splice to the steel in the previous pour.

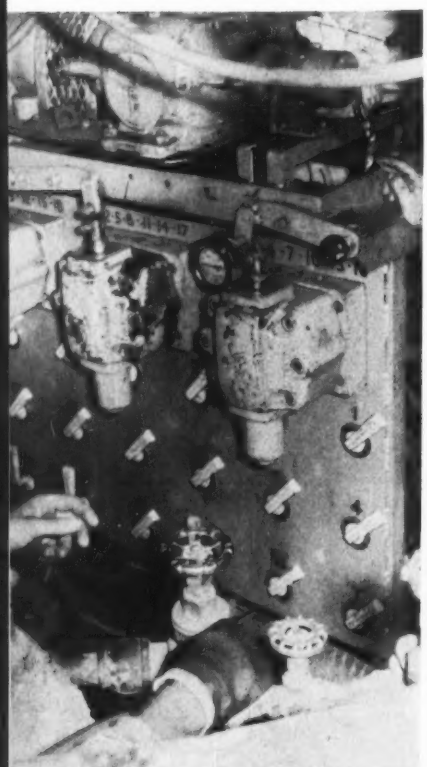
The forward ends of the rods are inserted into special holders, or pipes, that are attached to the inside of the Teredo's shell. The rods are not attached to the pipes and stay in place while the machine moves forward.

Concrete is placed into each section by a slick pipe through an opening in the top center of the bulkhead. An Airplaco concrete placing machine with a 15-cu-ft displacement handles the concrete. It operates on compressed air supplied by a 600-cfm Gardner-Denver compressor. The concrete is a seven-sack, 3% air entrained mix with No. 5 Pozzolith retarder.

STEEL SPACING—Longitudinal bars pass through properly spaced holes in the circular plate. The numbered adjustable struts are connected to push beams and the plate.



CIRCULAR PLATE—The plate has been advanced and all steel is in place for a pour. Pairs of small flanged rollers, attached to the shell, hold the adjustable struts.



CONTROL PANEL—Controls for the 18 hydraulic jacks are arranged in three groups of six each. The jacks may operate individually, by groups, or all at once.

The concrete is pumped in from street level. At the start they brought it in through the tunnel portal, but as the Teredo moved ahead they began to pump it through manholes spaced at about 500 ft.

As the machine bores its way forward, tunnelers have to make sure the machine stays on its proper course. The Teredo can change direction in three different ways.

The jacking pressures around the shell can be varied. Three hydraulic master valves control six jacks each. They may be operated together or individually. In addition, each of the 18 jacks can be regulated by a manual valve. The valves have forward, neutral, and reverse positions.

Movable fins on top and bottom of the leading edges of the shell also help maintain direction. The fins can be turned from the inside of the machine to work like rudders. They also prevent the machine from rolling.

Eccentric gears on the cutting arm offer yet a third way of guiding the tool. An offset of 1 in. in any direction from the centerline of the machine can be made with the cutter arm. Any one of these or a combination of two or all three methods can make the Teredo veer to either side or nose up or down.

To insure accuracy, the tunnel crew is making pours only about every 6 ft. The machine's position is checked and can be corrected before the tunnelers get too far off course.

At the start, progress was slow because the crews were unfamiliar with the machine, and the Teredo encountered some rather tough limestone. The cutters on the rotating arm wore out frequently and had to be replaced. A porthole near the top and one near the bottom of the bulkhead provide access to the cutters.

To avoid losing time in replacing the cutting teeth, Gardner's shop redesigned the whole cutting mechanism. The original cutting arm was equipped with a toothed chain adapted from a trenching machine. The teeth were hard-surfaced by painting them with tungsten carbide.

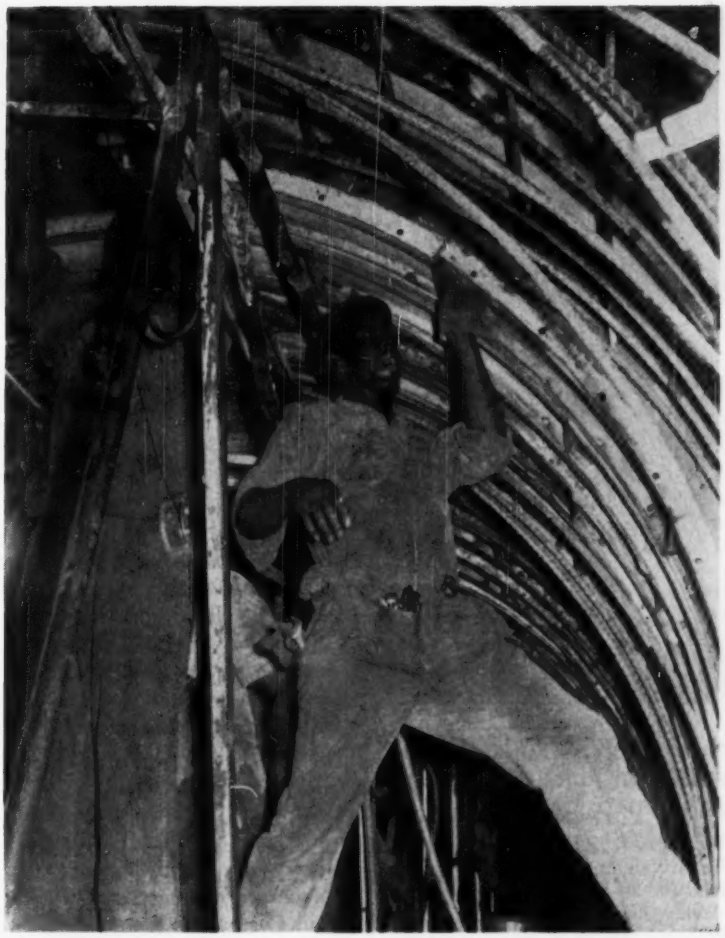
OUTSIDE FORM—The circular plate has moved ahead exposing the Teredo's shell and the end of the previous pour. The plate positions longitudinal steel as it advances.

Gardner modified the cutting arm by enclosing the drive chain in an oil-lubricated case and substituting rotary cuttters for the trencher teeth. Now the crews work five or six days without replacing cutters.

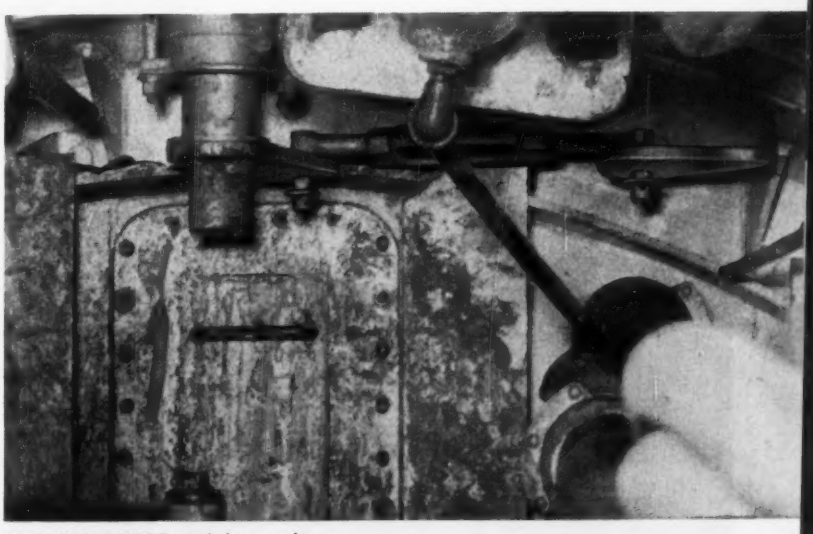
Even with the low bid price and the promise that traffic would not be disturbed when tunneling under streets, Gardner almost failed to get the contract. City officials were reluctant to give their approval to this untried tunneling method. Gardner landed the contract by promising to build the storm sewer by the cut and cover method at his own expense if the machine couldn't do the job. But the Teredo is working successfully and has completed about half of the tunnel.

"Sure, I gambled on the teredo," Gardner says, "but I was gambling on the judgment and ability of my men who designed and built it piece by piece. So I figured the odds were all in my favor."

He credits the success of his $75,000 investment to four of his men: E. A. Horstketter, vice president and design engineer; Marshall Boehning, field superintendent; Frank Fuller, hydraulics specialist; and W. H. Duval, shop superintendent.



INSIDE FORMS—Sectional forms for the inside of the lining are the last to be put in place before pouring. The 1-ft-wide steel form sections are bolted together.



STEERING DEVICE—A linkage and turnbuckle just behind the bulkhead control a rudder on the outside of the shell. Hatch gives access to the cutting mechanism.

"We carry up to 2,500 lb. more FORD Tandems and still outrun

SAYS HARRY R. KUNZ
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Mr. Harry R. Kunz, a Registered Public Accountant in the construction field for 20 years, started the Kunz Paving Company in 1954. He and his two sons, Harry Jr. and Gerald, expect to do $500,000 worth of work with their fleet of 16 Ford Trucks this year. Here is what he has to say about these trucks.

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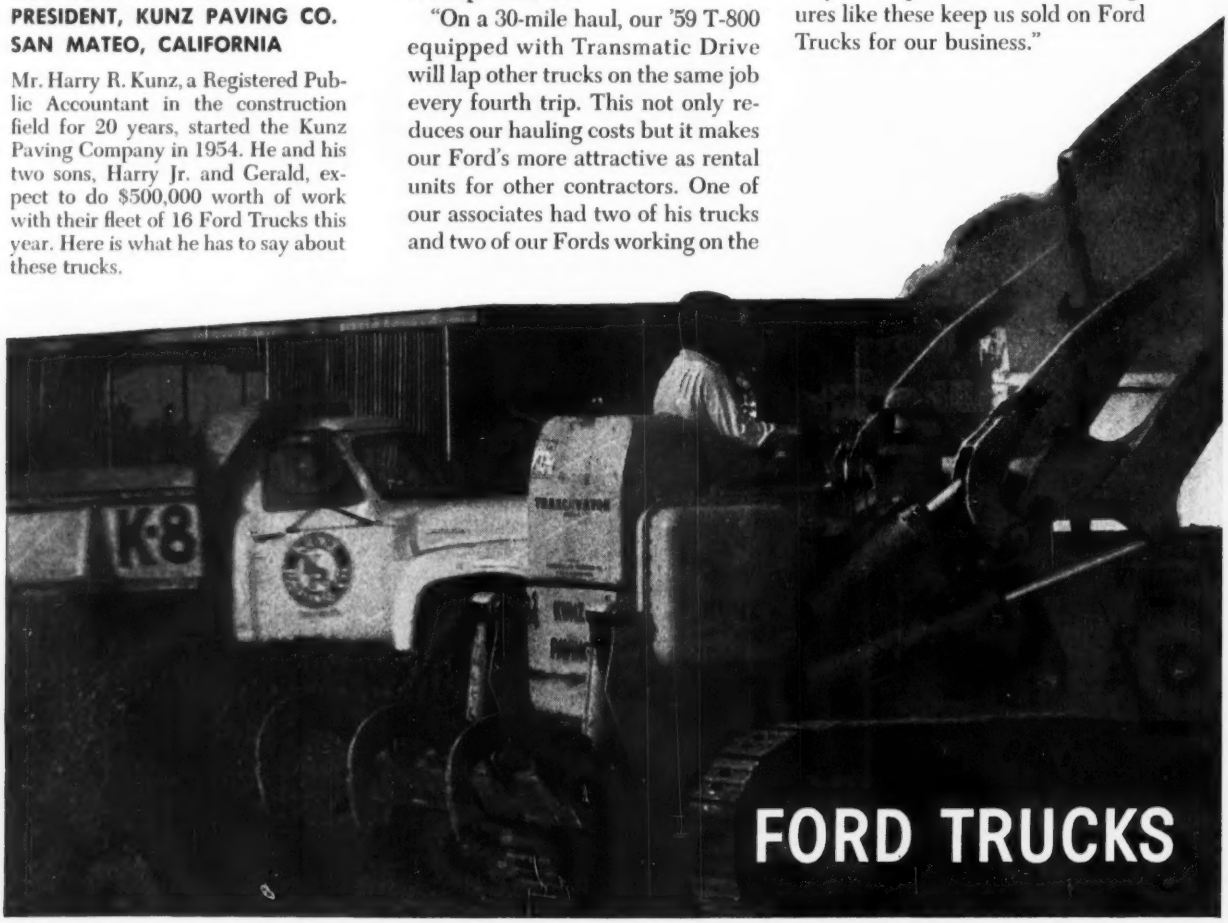
"On a 30-mile haul, our '59 T-800 equipped with Transmatic Drive will lap other trucks on the same job every fourth trip. This not only reduces our hauling costs but it makes our Ford's more attractive as rental units for other contractors. One of our associates had two of his trucks and two of our Fords working on the same job. He actually paid for the rental of our trucks by the extra trips they made.

"Our cost records, set up on an hourly basis to make it easier to prepare bids, show that the longer life built into Ford Trucks makes them less costly to operate. We have one '56 Ford T-750 with over 100,000 miles on it that we use as a base for our tandem hauling costs. In spite of its high mileage – gas, oil, tires, maintenance and repairs amount to only $2.08 per hour. Facts and figures like these keep us sold on Ford Trucks for our business."



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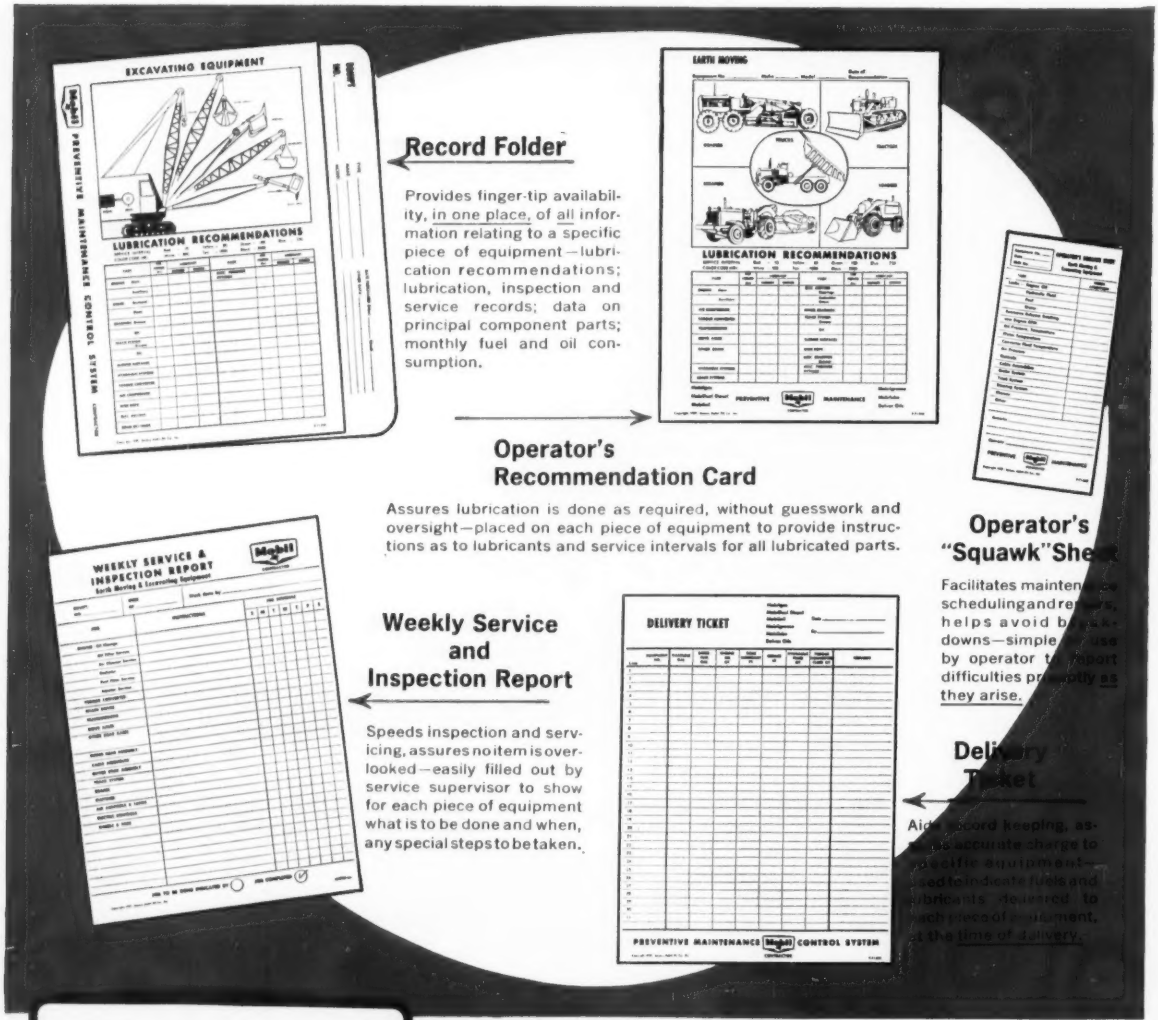

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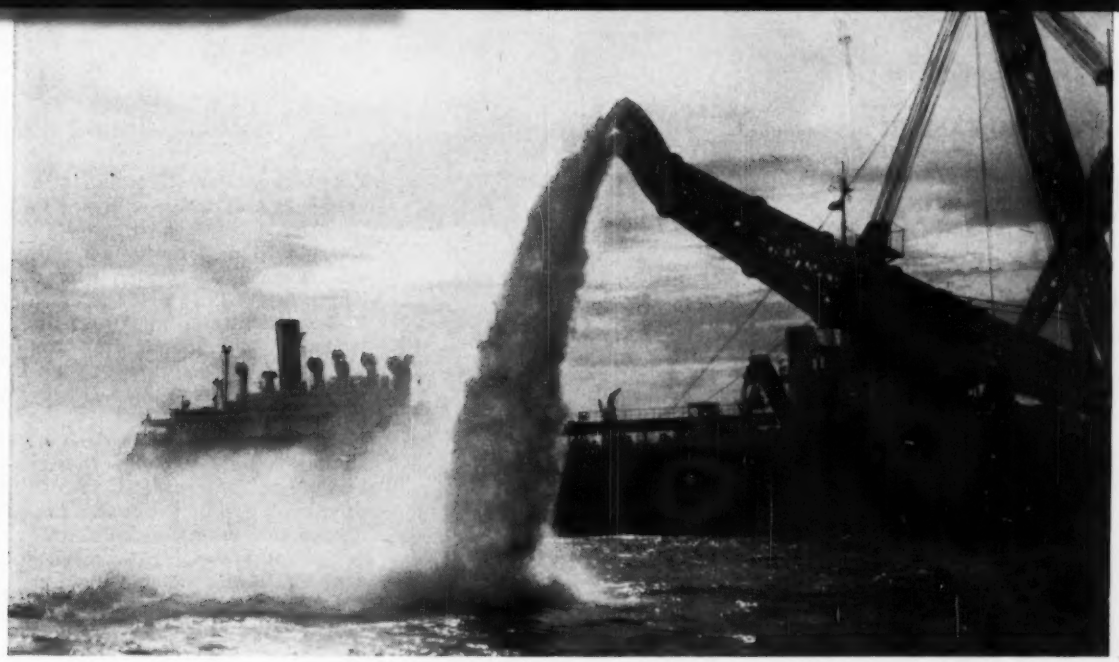
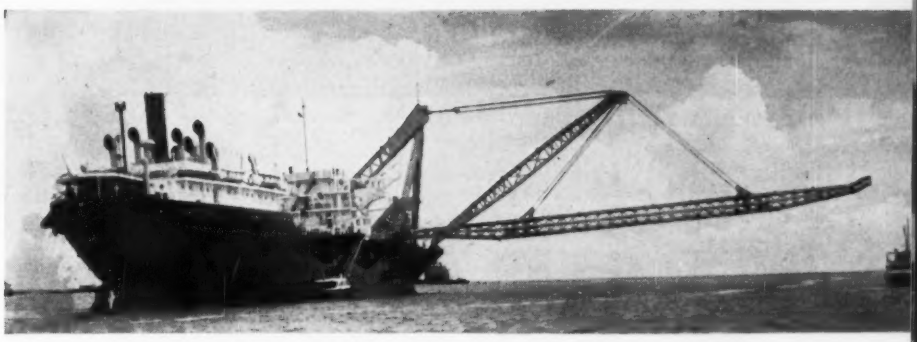


BOOM DREDGE — Discharge lines extend 240 ft from side of ship on boom. Ends of lines are pinched slightly and tilted upward to throw dredged material an additional 30 ft.



Converted Tanker Opens Channel

A new type of dredge handles a job in South America for half the cost of a pipeline dredge. It can discharge material 270 ft to one side.

A NEW TYPE of suction dredge that can shoot dredged material 270 ft out from the side of the ship is handling a major channel job that up to now was considered completely uneconomical.

The new dredge removed 50,000,000 cu yd of material from a shipping channel in the Orinoco River in Venezuela at a cost of 11¢ per yd. A conventional setup, in this case a pipeline dredge, would have cost twice that.

The dredge, called the Sealane, is the first sea-going suction dredge of its kind in existence. It is a converted oil tanker with part of the hull section removed. The unique feature of the rig is the 240-ft boom that extends outward from the side of the ship. The boom carries two 32-in. discharge lines. For traveling, the boom swings around parallel to the ship.

Orinoco Mining Co., a subsidiary of U. S. Steel Corp., is handling the job at a cost of $9.3 million for Venezuela's National Institute of Channels.

Two Channels

The Orinoco River passes through an extensive delta to reach the Atlantic Ocean. There are two semi-navigable natural channels through the delta: to the north, the Cano Macareo winds 109 mi to Boca de Serpiente; to the south, a 139-mi channel goes through Boca Grande to the Atlantic.

In 1947, a commission of the U.S. Army Corps of Engineers, which was studying navigation on the Orinoco River at the request of the Venezuelan government, recommended that the Cano Macareo route be opened to shipping. In 1952, Orinoco Mining Co. adopted this route. They dredged the river from Puerto Ordaz to the sea at a cost of $9 million under a 50-year contract with the national Institute of Channels.

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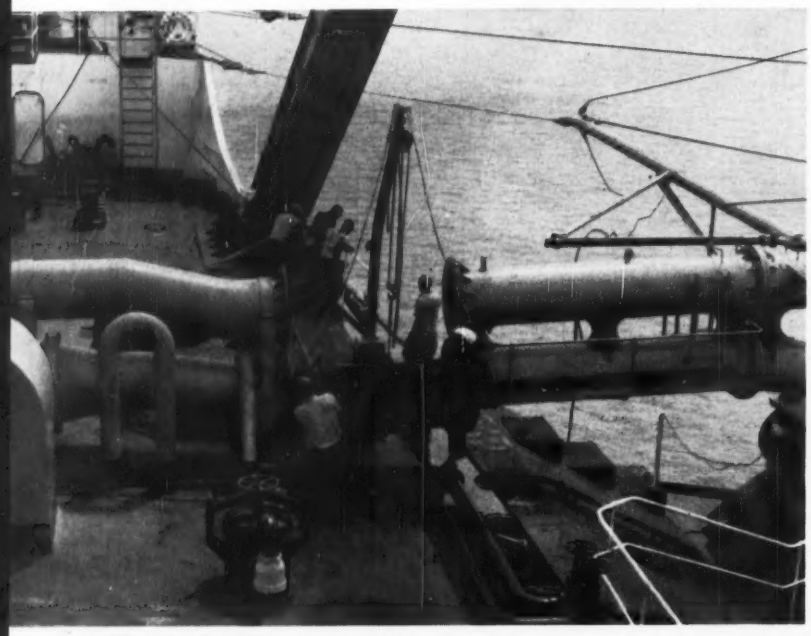

PIPE CONNECTIONS—Flexible, 7-ft-long rubber pipe connects twin 32-in. pipes (left) from dredge pumps in hull of vessel to corresponding 240-ft-long discharge pipes (right) that extend to end of boom.

BOOM SUPPORTS—Horizontal boom is supported by diagonal strut and series of block and tackle assemblies. Universal joint on shipboard end of boom allows it to swing parallel to ship for traveling.

Since then, annual maintenance costs have steadily increased. On the average, 25,000,000 cu yd are dredged annually, compared with 30,000,000 cu yd of original construction. Last year the dredging cost was $5 million.

In addition, navigation problems became serious as traffic increased, because the Cano Macareo channel though the shorter of the two routes, is more winding. Last year more than 1,000 oceangoing ships used the channel to carry 12,000,000 tons of ore from the Cerro Bolivar workings of Orinoco Mining Co.

The solution to both maintenance and navigational problems was to dredge the southern route to Boca Grande. The New York engineering firm of Tippetts-Abbett-McCarthy-Stratton laid out a dredging plan and made design recommendations for a boom-type dredge that could open and economically maintain a channel in the rough waters of the Atlantic Ocean at the mouth of the river.

The engineers ruled out dredging with a pipeline because the open water was too rough. They also figured hopper dredges would not be feasible because of the cost.

Converted Tanker

Universe Tankships, Inc., a subsidiary of National Bulk Carriers, converted the 16,000-ton T-2 tanker Pan Georgia to a dredge in a Japanese shipyard in 1956.

One section of the tanker hull was removed to shorten overall length from 525 ft to 475 ft. Two 32-in. centrifugal pumps were installed in the hold. A drag iron with 36-in. suction pipe was suspended from a davit on each side of the ship.

Operation of the Sealane is similar to that of a hopper dredge except that the pumps, instead of dumping into a hopper, discharge through two 32-in., 240-ft lines that are suspended horizontally from a boom extending outward from the starboard side of the ship. The discharge lines are pinched and elevated slightly at their tips to jet the dredged material about 30 ft beyond the end of the lines.

The base of the boom is seated in a universal joint mounted on a "blister" welded to the side of the ship. The discharge lines pass through the boom near its base, just above deck level. The lines are coupled to the pump lines on deck by flexible rubber tubing about 7 ft long.

The boom and discharge lines are held in a fixed position at right angles to the centerline of the ship during dredging operations. When the ship travels, they swing 90 deg and are fastened to a stay on board the vessel.

Normal draft of the Sealane is 16 ft but this can be reduced by lightening the fuel load. In parts of the Boca Grande bar, the vessel pushed through soft bottom to operate in as little as 11 ft of water.

Operations

There were three major sections to the dredging operation. The biggest was a 26-mi stretch through a bar at the mouth of the Boca Grande area of the river. Two smaller sections totaling 5½ mi were upstream.

The completed channel is 139 mi long with a minimum low-water depth of 30 ft and a minimum width of 400 ft. The old Cano Macareo channel had a minimum depth of 24 ft and a minimum width of 197 ft.

The Atlantic Ocean at the mouth of the Boca Grande is not particularly stormy, but waves occasionally get as high as 35 ft. Clearance of the Sealane's dis-

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charge lines is 25 ft above water. During the 26 months of operation, the dredge never had to stop work; when the waves got too high, it shifted to the inner part of the channel. The boom was hit by waves on three occasions. In each case damage was slight and did not interrupt operations.

A combination of river and coastal currents produces a vector current that crosses the channel roughly at right angles. It helps carry dredged material out of the cut. In spite of this help, the dredge re-handles 50 to 75% of the material. It can do this economically because its operation costs are so low.

The bar section of the channel is composed of mud and fine clay particles. This fine material remains in suspension long enough for the current to carry much of it away. The particles that settle form a compact, stable channel slope with a steep angle of rest. The deep inner part of the channel has 1:6 slopes. Along the sides, the channel is beveled off to a slope of 1:30.

One reason why the Boca Grande channel was not developed earlier is that the engineers believed the entire bar was underlain with sand. Because sand settles quickly, a dredge would have had to re-handle much more of it. Also, because sand requires a flat angle of repose for stability, the channel would have had to be much wider.

Maintenance

The volumne of maintenance dredging in the new channel will be about 40% that of the old channel. Because the unit cost with the Sealane is half the cost of pipeline dredging (the method used in the old channel), the overall outlay for maintaining the new channel will be only about 20% of the former cost.

Maintenance costs in the Cano Macareo were about $5 million. So the new channel will show a savings in maintenance costs equal to the original dredging costs in about 18 months. This eventually will be reflected in lower toll charges.

New Dredge

In addition to its maintenance work Sealane will deepen the channel to a minimum year-around draft of 34 ft. This will cost an additional $6 million.

The Venezuelan Institute of Channels is so impressed with Sealane's performance that they have acquired another vessel of the same type. The new one is the world's largest suction dredge. It also is the only dredge in the world designed to operate either as a hopper-type or a boom-type dredge.

The vessel is similar in design to Sealane but is 548 ft long with a beam of 95 ft. Hopper capacity is 8,500 yd. Boom lines discharge material at a distance of 328 ft from the dredge.

The new dredge was built in Kure, Japan, by Seadredge, Inc., another subsidiary of National Bulk Carriers. It started work at Maracaibo in December.

The boom is mounted in the center of the ship and can swing a full 180 deg to discharge material directly behind the ship.

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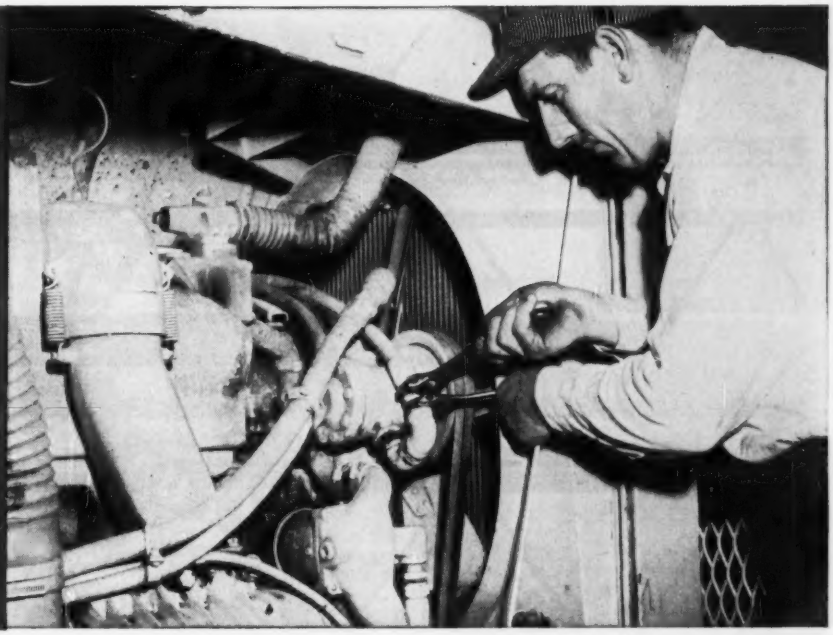

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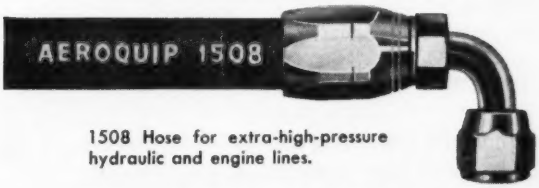

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What is the Steel Joist Institute?

It is a voluntary association, organized in 1928, of open web steel joist manufacturers. Membership is available to any producer of open web steel joists who elects to manufacture joists in accordance with the standards and practices as adopted by the Institute.

What is its purpose?

The Steel Joist Institute is a nonprofit organization made up of manufacturers actively engaged in the fabrication and distribution of open web steel joists. It was organized to place the industry on a sound engineering basis. Its objectives are to establish methods of design and construction for open web steel joists, to provide test and research data for public dissemination, to assist in the development of appropriate building code regulations, and to publish information relative to the proper use of steel joists in the interest of safety and the public welfare.

What are its accomplishments?

The Institute has made substantial practical contributions to the building construction industry. It has developed and published a comprehensive manual of standard specifications, load tables, and technical bulletins to assist the architect, engineer, and contractor; conducted research and testing of open web steel joists, bridging and cantilever members; initiated a thorough, effective quality verification program for "S" Series joists and a recommended Code of Standard Practice applicable to steel joists used for spans up to 96'.

Inquiries concerning the Steel Joist Institute should be sent to the Managing Director, Steel Joist Institute.

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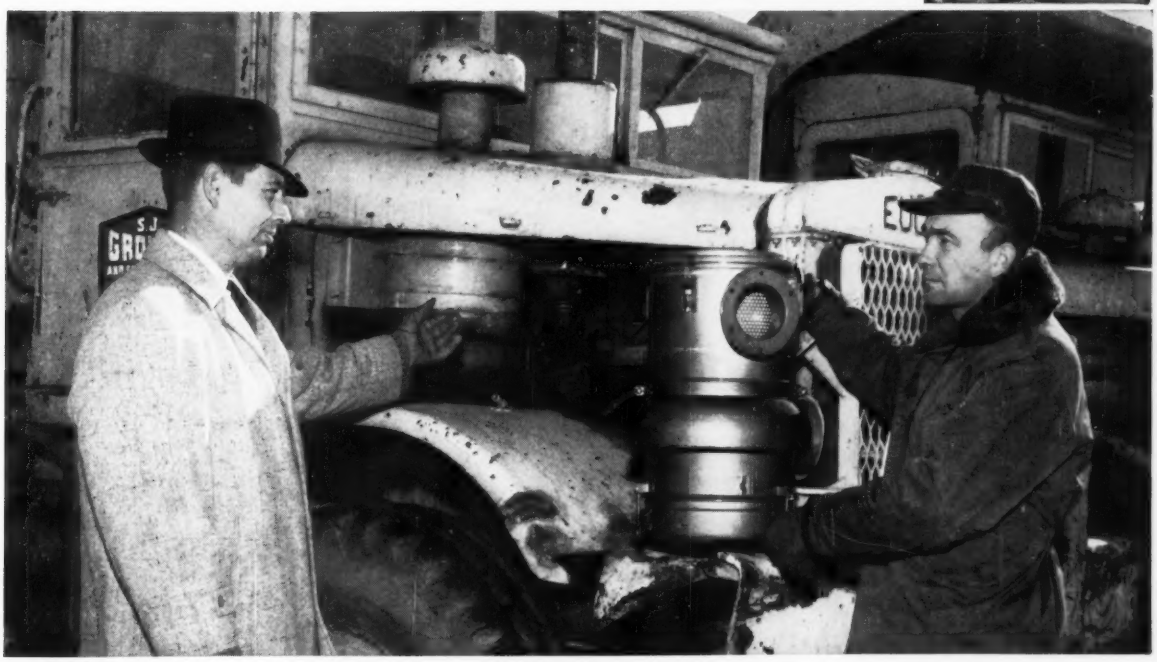
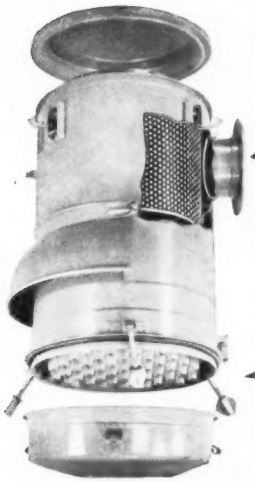
Dave Armstrong, Maintenance Superintendent





Only 2% of dust reaches Duralife paper filter!

Embossing and pleating provide maximum filtration area. Controlled porosity gives 99.9% dust removal.

98% of dust removed here!

Cluster of Donaclone tubes make up highly-efficient primary centrifugal cleaning stage. Dust is ejected into dust cup for easy servicing.

Paper filters filter best, but it takes efficient pre-cleaning to make them practical from the servicing viewpoint. Note above that Donaclone tubes remove 98% of the dust. Only 2% reaches the Duralife filter, greatly increasing service life.

"Savings in service time and oil, and higher cleaning efficiency, were main factors in our choice."

World-famous S. J. Groves & Sons Company, is one of many contracting firms who have installed Donaclones on much of their heavy equipment. During the changeover to Donaclones, priority was given to machines which operate in heavy dust, where Donaclone efficiency and service savings are most marked.

Donaclones are the dominant choice, not only among heavy construction contractors, but also among engine and equipment manufacturers. Nearly all leading builders have shifted or are in the process of converting to Donaclone air cleaners.

Donaclones are 4 ways better. Their 99.9% cleaning efficiency is from 10 to 20 times better than oil-washed types, increasing engine life far beyond what is now considered normal and satisfactory. They use no oil, eliminate messy servicing and cost of oil, too! Servicing time is cut to a fraction of that previously required, and constant, low operating restriction saves fuel.

Add years to the life of your equipment! Convert to Donaclone protection now. Write or wire for name of nearest distributor.

Donaldson
COMPANY, INC.
666 Pelham Blvd.
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Donaclone
DUO-DRY
AIR CLEANERS

Tough underpass job finished on time despite high ground

GULF MAKES THINGS

Take the unusually high ground water level of New Orleans, add a lot of rain, then tackle a job like this on a tight schedule. Build a $2,000,000 underpass beneath a 3-deck interchange (all decks in use with heavy traffic) with headroom under ramps as low as 22 feet. Brother, you've got a tough one.

That was the case with Melvin "Red" Morgan, Project Superintendent for R. P. Farnsworth & Co., Inc., New Orleans. His job was to build an underpass system beneath the Airline Highway-Causeway Boulevard Interchange for the Department of Highways, State of Louisiana. (Palmer & Baker, Inc., were the consulting engineers.) To add to his construction problems, a busy railroad line angled across the site.

Farnsworth & Co. finished the job on time—with help from clean-burning Gulf diesel fuel, clean-working Gulf Dieselube H.D. motor oil, and Gulflex A grease. Gulf products enable Farnsworth's engines to run clean with maximum power output. Equipment stays on the job with a minimum of mechanical delays. And maintenance

High ground water kept shovel tracks soaking wet throughout the digging operation. Here, a workman performs preventive maintenance with Gulflex A multi-purpose grease.

Gulf Sales Representative Al Pfister, right, with Farnsworth Project Superintendent Melvin Morgan. You can always rely on helpful petro-engineering service from Gulf at the job site.

water level and low headroom . . .

RUN BETTER!

costs are trimmed to the bone. Proof, again, that Gulf makes things run better!

"Red" Morgan says, "During the 16 years I've been with Farnsworth, I have used Gulf fuels and lubricants on every job but one. That's why I knew that we wouldn't have any combustion or lubrication problems with Gulf oils and greases."

You can do the job faster and reduce maintenance costs with Gulf products and service. For proof, call your Gulf office, or write for "Gulf Contractors' Guide."

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

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SP-9739

You and UNIT earning power

. . . a payload partnership

Completely satisfied with the performance record of his two UNIT ¾ YD. excavators, Mr. James Lavin of JFL Trucking and Excavating, West Allis, Wis., says he'll pick UNIT again when buying a new machine.

Buying major construction equipment is almost like marriage — you'll live with your choice a long time. That's why it's important to choose the bigger *earning power* of a UNIT excavator or crane. You'll find that your equipment investment will pay off with fast cycle speeds, big output and more dependable performance than other machines in the same size range. You and your UNIT will have a true *payload partnership.*

Fast work on the job — lowest operating cost — negligible downtime . . . these are but some of the reasons why the *earning power* of a UNIT lets you knock out the competition at bid letting time. You win more contracts with a combination of job-proved features, finest quality components and unmatched workmanship.

Features like UNIT'S exclusive one-piece cast main machinery gear case that completely encloses all gears and shafts in a constant bath of lubricant . . . eliminating frequent adjusting or greasing. UNIT offers straight-in-line mounting of the engine with the main machinery to give longer machine life and perfect alignment of all working parts. All disc-type operating clutches are interchangeable . . . can't grab or self-energize. The exclusive automatic traction brakes on crawler machines assure positive, safe braking power . . . even on the steepest grades. Long, wide-spread crawlers and a big, heavy carbody provide the solid working base you need to get full dippers in the toughest material.

You can start on the road to your *payload partnership* right now by calling your UNIT dealer. He's got the detailed information you need on the 5 UNIT convertible crawler machines, 4 UNIT convertible truck cranes and 2 UNIT mobile cranes.

SHOVELS	HOES	CRANES	DRAGLINES
½ to ¾ YDS.	½ to ¾ YDS.	5½ to 40 TONS	½ to ¾ YDS.

UNIT

UNIT CRANE & SHOVEL CORP.

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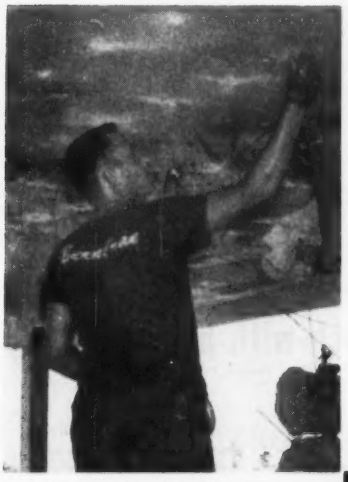
Milwaukee 19, Wisconsin

On this lift slab job, parts of the floor slab came up with the roof slab. Experts had to blast the stuck sections off.

Blasting Salvages Concrete Roof Slab

DRILLING—Workman operates drill as partner controls plank supporting drill butt.



PLACING CHARGES—Powder man inserts 1 oz. charge of 40% gelatin in bore holes. Job required 3,500 charges.

SKILLFUL DYNAMITING salvaged the 150x100-ft concrete roof slab of a one-story building near Salisbury, Md.

It was an ordinary lift slab job, but something went wrong. The contractor poured the roof slab on the floor slab after spreading a bond prevention compound over it. But when his crews activated the hydraulic jacks to raise the roof slab into position on top of the steel columns, nearly 8,000 sq ft of the mesh-reinforced floor slab came up with it.

They tried to pry the two slabs apart with jackhammers, crowbars, and wedges. No luck. Finally the contractor called in a Baltimore blasting expert, Burnbrae, Inc., to salvage the roof slab by blasting off the stuck portions of the floor slab.

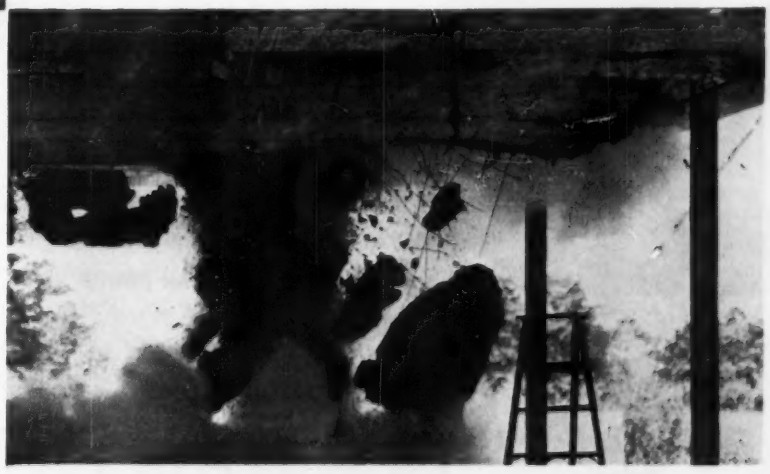
To justify dynamiting, these floor areas had to be blasted off cleanly without damage to the 7-in. thick roof. Burnbrae decided that fractional stick charges—about 3,500 of them—offered the best approach. After several test shots, the blasting firm selected a 1x1½-ft grid pattern of bore holes 1 in. in dia. These bore holes passed through the full 4¾ in. thickness of the bonded floor slab.

Drilling so many bore holes posed a problem for the building contractor. Two workmen with a pneumatic drill stood on a platform supported by scaffolding to make bore holes flush with the bottom of the roof slab. They rested the butt of the drill on one end of a 3x5-ft plank braced by a sawhorse. With the sawhorse as its fulcrum the plank served as a lever to raise the drill upward. One workman operated the drill while the other controlled the plank.

Burnbrae handled the placement and firing of explosives. They loaded several dozen bore holes during each loading period, but fired only four charges at a time. Charges were all 1 oz of 40% gelatin, stemmed with clay and primed with instant electric caps. These charges were fired with a push-down blasting machine 200 ft away.

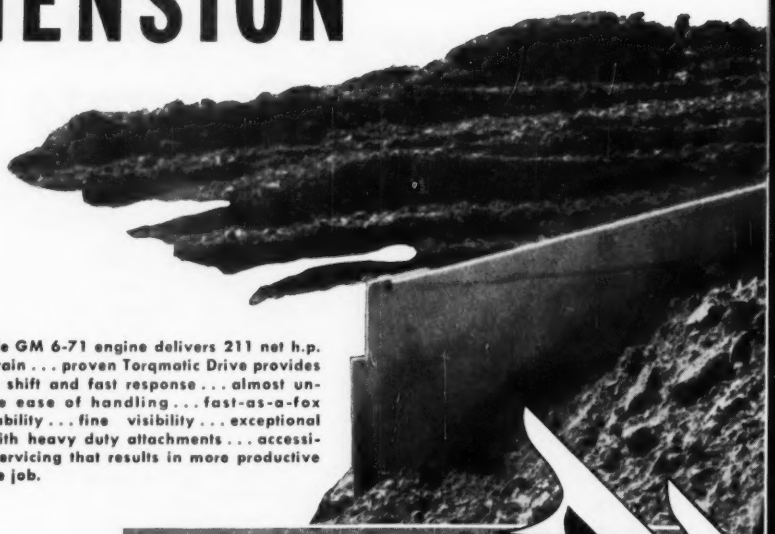
Because the force of the blast was practically straight down, throw was minor. What small particles did travel from the immediate point of blast were low-velocity rebounds off the floor.

The delicate and exacting work required 15 working days. The blasting removed all bonded areas cleanly, leaving a serviceable roof.



FIRING—Force of blast throws part of bonded floor slab straight down. Blasting machine 200 ft away fires four charges at once. Throw is minor—just a few low-velocity rebounds.

EUCLID'S GREATER DIMENSION



Dependable GM 6-71 engine delivers 211 net h.p. to power train . . . proven Torqmatic Drive provides full-power shift and fast response . . . almost unbelievable ease of handling . . . fast-as-a-fox maneuverability . . . fine visibility . . . exceptional balance with heavy duty attachments . . . accessibility for servicing that results in more productive time on the job.

The C-6 has the speed, power and maneuverability to handle every kind of tractor job . . . ripping, dozing, push loading, clearing, towing and other heavy work. Many major components including Torqmatic Drive, engine, and planetary drive axle have been job proved in thousands of Euclid earth-movers. Owners say that full-power shift, easy operation and fast response give the C-6 more work-ability than any other crawler in the 200 h.p. class.

Facts and figures on the Model C-6 and Model TC-12 "Eucs" are available from the Euclid dealer in your area . . . get in touch with him soon!

Greater Dimension in power and performance . . . TC-12 has 2 engines that deliver a total of 425 net h.p. . . . independent track drive with separate power train and Torqmatic Drive for each track . . . full-power shift and instantaneous reverse . . . 8 track rollers . . . unequalled accessibility for servicing . . . maneuverability and workability that have set new standards of big tractor performance.

Proven Torqmatic Drives deliver a smooth flow of power to each track . . . with full-power shift there's no delay for clutching and shifting . . . change direction with a flick of the wrist . . . 425 total net h.p. is automatically matched to every job requirement . . . rigid track alignment maintained by independently suspended track frames and final drives . . . years-ahead engineering reduces downtime and maintenance costs for a better return on investment.

Crawlers without full-power shift are obsolete . . . and costly!

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

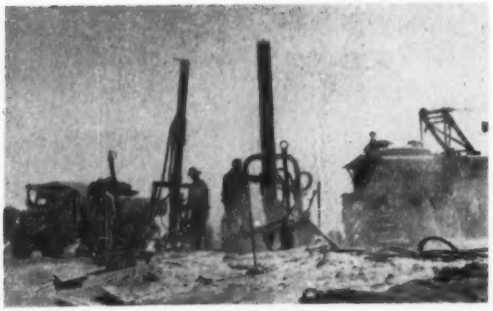
IN MODERN CRAWLER DESIGN

With over twenty-five years of experience in building heavy earth-moving equipment exclusively, Euclid offers a greater range of types and capacities, a greater background of field experience, and a greater return on your equipment investment.

One example of this greater dimension was the introduction of the Model TC-12 Crawler over 5 years ago. Here was an entirely new concept of tractor design . . . two engines, each driving a separate track through its own Torqmatic Drive . . . unequalled power and work-ability . . . performance that set a new standard of crawler productivity . . . ease of operation and servicing that is still unsurpassed in the industry.

Recently the Model C-6 Euclid tractor went into production after the most comprehensive field trials and proving ground testing ever given any new Euclid model. It, too, has Torqmatic Drive and full-power shift as well as many of the advanced design features of the bigger TC-12. And like the "Twin", the new C-6 utilizes major components that have been job proved in thousands of "Eucs" in construction, mine and quarry service. For instance, the Allison converter and semi-automatic transmission "package" has long since passed the pioneering and development stage . . . it's been used in "Euc" scrapers, rear-dump haulers and other models for years. These two Euclid crawlers provide so much more work-ability that they obsolete tractors without the operating advantages of full-power shift.

EUCLID Division of General Motors • Cleveland 17, Ohio



BLASTING ROCK—Wagon drills place holes for charge to blast rock obstruction located by pre-drilling exploratory holes ahead of backhoe excavating trench.

PLACING PIPE—Workman connects pipe sections lowered into trench by Michigan loader. Backhoe cuts trench 20 ft ahead of pipelaying crew, and loader backfills.

Drill Explores Ahead of Trench

BORING exploratory holes ahead of the backhoe that excavated the trench enabled a contractor to locate and blast rock well ahead of the pipelaying crew without keeping open a long stretch of trench.

American Construction Co., Hartford, Conn., used this pre-drilling system to good advantage for laying 10½ miles of pipeline for Bethlehem Steel Co.'s new research center on top of South Mountain at Bethlehem, Pa. Limited working space at the 50-acre site made open trenches a troublesome obstruction to construction traffic.

At the start, before trying the pre-drilling method, American dug a short 20-ft section of trench ahead of the pipelaying crew with a 1½-yd Northwest backhoe. But they found that operations came to a standstill whenever they hit rock. The backhoe then had to wait while a crew drilled and blasted the rock. And rock cropped up unexpectedly all along the line.

On the north side of the mountain seams of granite, limestone, gneiss, and quartzite cropped up close to the surface in many places. Although seamy, the rock was extremely hard. About half the 65,000 yd of material in the pipeline trenches had to be blasted before excavation.

American next tried to avoid delays by opening up a 200-ft stretch of trench ahead of the pipelaying crew. Once the drilling crew had such a head start, production went up. But the open trench interfered with other construction in the confined area.

Bore Holes Locate Rock

They finally hit on pre-drilling exploratory holes. They kept only a 20-ft section of trench open behind the backhoe but avoided delays in excavating ahead because rock obstructions had been located in advance and blasted.

An Ingersoll-Rand Crawl-IR tractor-mounted drill rig placed the exploratory holes along the trench centerline. Spacing of the holes averaged about 4 ft. When the rig hit rock, a team of wagon drills moved in to take care of the additional holes for the shot.

Three Ingersoll-Rand wagon drills together with a Worthington and a Gardner-Denver were on hand for the drilling. Compressors available to supply air to the drills included two Jaeger 600-cfm units, and Ingersoll-Rand 600, and several smaller LeRoi's.

Depth of the trench averaged 12 ft, but sometimes reached as much as 22 ft. Width of the trench was about 3 to 4 ft at the bottom; it widened out towards the top according to the depth. No sheeting was required to hold the banks.

The drill rigs placed holes on 4-ft centers on either side of the centerline holes. Powder crews loaded sticks of 1½-in. Hercules semi-gel in each hole. They shot as much as 1,200 lb of powder per round.

The rock was extremely hard on drill bits. American used as many as 18 per day and averaged only 5 ft with a single steel bit. With carbide-insert rock bits they got about 125 ft of hole per bit. Drill steel is 1½-in. round Bethlehem rods.

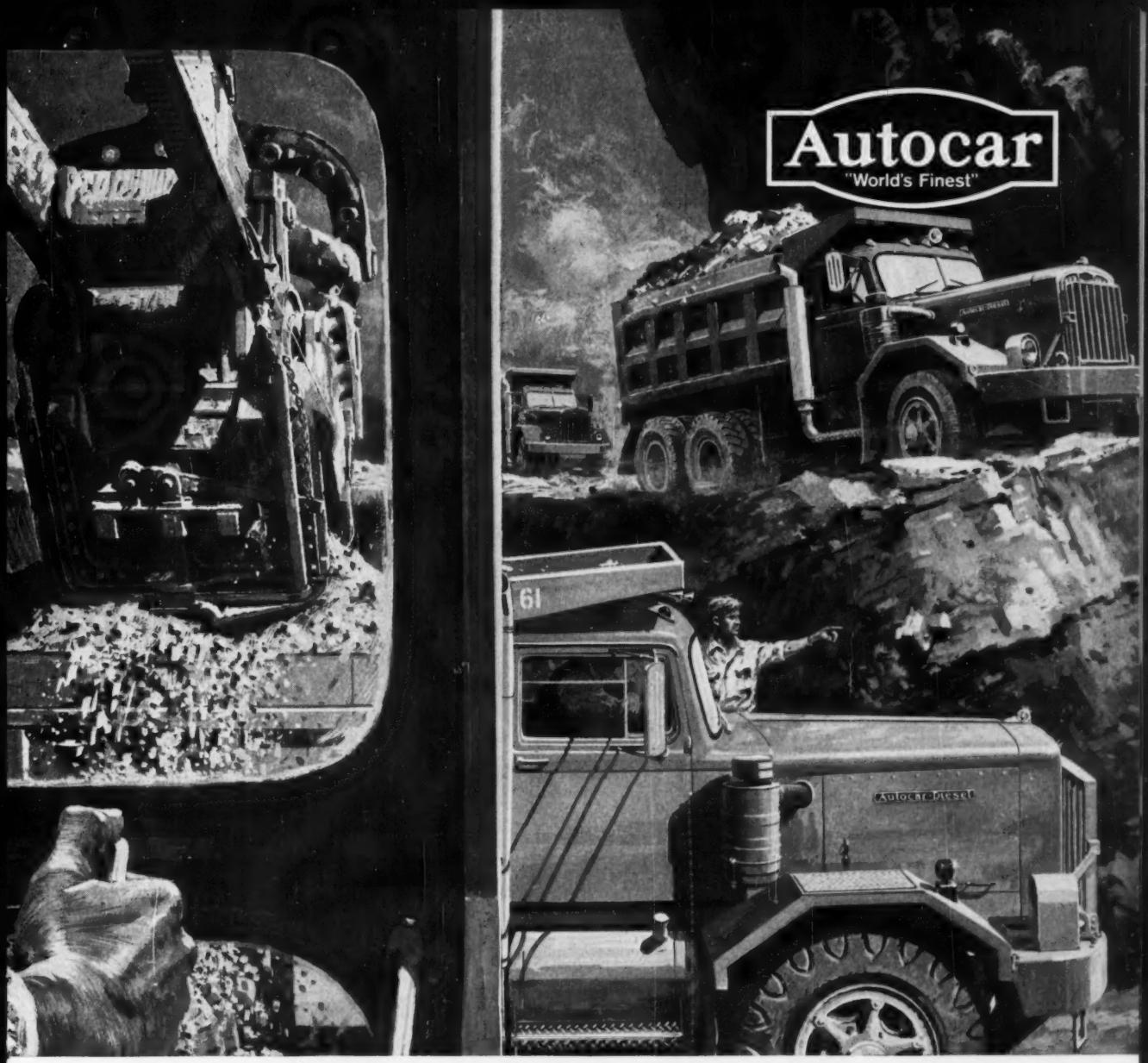
Beads Block Bit Hole

To prevent rock cuttings from choking the hollow carbide bits they welded a steel bead in the center hole but left the smaller holes around the edges of the bit open so they could blow the hole every few feet.

Peak production for the pipelaying crew was about 120 ft per day. A Michigan loader handled both pipelaying and backfilling. It swung the 20-ft sections of Bethlehem corrugated steel pipe to workmen in the bottom of the trench. (Size of pipe ranged from 12 to 48 in.) a cable looped around the lightweight pipe and attached to a bracket bolted to the loader bucket held the pipe sections.

After the crew had tied the end of the pipe into the previously laid section by tightening a galvanized steel connecting band, the loader backfilled the trench to complete the job.

Project superintendent for the prime contractor, Turner Construction Co. of New York, is Jim Fouhy. Louis Pergiovanni is in charge for American.



Job for Autocars—A truck is a production tool, and tools must match the job—like the Autocar ten-wheelers shown at work here.

Peak production calls for Autocar . . ."nothing less"

It doesn't pay to mince words. When your shovel piles on a yard more every time—when the floor is rough, rocky or difficult—when you can't afford a slowdown in the hauling cycle—*you need an Autocar.*

And *only* Autocar *fully* custom-engineers each truck to fit the job . . . your assurance of top performance.

Autocar's great load capacity, power and stamina are the result of the way Autocars are built—with unequaled precision and quality.

Where the jobs are tough and schedules tight, Autocars are an absolute necessity. If you settle for less, you'll *get* less—so why try to get by without the "World's Finest"?

Autocar service is prompt and comprehensive at all White-Autocar outlets . . . in every major city.

Autocar
"World's Finest"

Division of
The White Motor Company
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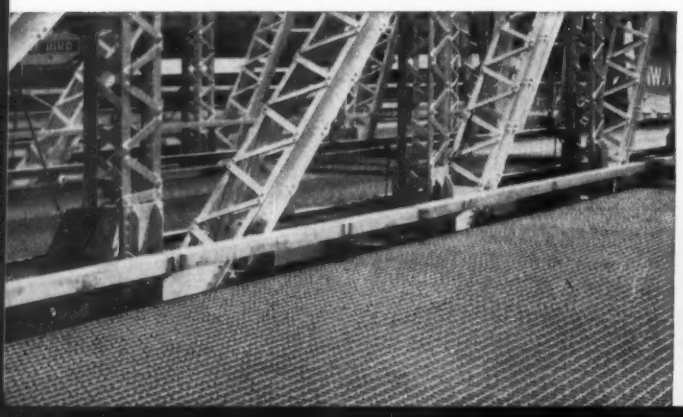
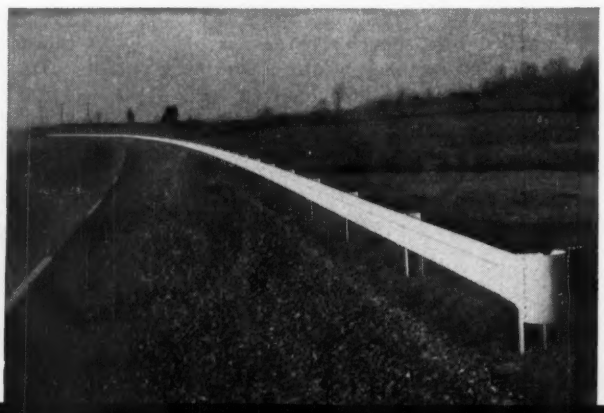
USS AmBridge I-Beam-Lok is a sturdy, lightweight bridge flooring. It installs quickly and easily with few interruptions. The filled type is available in units 6′ wide and up to 49′ long that apply directly to stringers on spans from 6′ up to 8′ centers. The open type is also available for spans up to 4′ long.



USS AmBridge Highway Beam Guardrail and Posts help safeguard traffic. This rugged, flexible steel beam guardrail is highly visible. It bolts easily but firmly to steel posts and is available in 25′ lengths to minimize splicing.



This is a people pipe

This passenger underpass was fabricated from USS AmBridge Sectional Plate—normally used for drainage structures. It's buried 10-feet below the railroad tracks at the Philadelphia Electric Company's Eddystone Station near Philadelphia, Pennsylvania. □ USS AmBridge Sectional Plate was an ideal choice for this underground passageway, because it won't crack. Won't break. It's a permanent steel structure. It was easy to erect . . . there was no need for forms. AmBridge Sectional Plate comes in a complete range of sizes. And, it's fabricated to meet all federal and state specifications. Write or contact any one of our offices for literature and information on American Bridge Highway Products.

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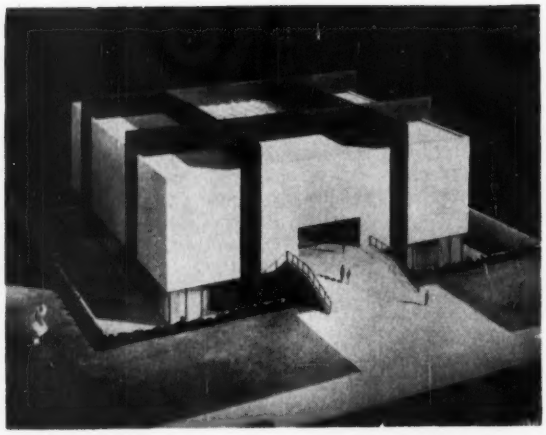
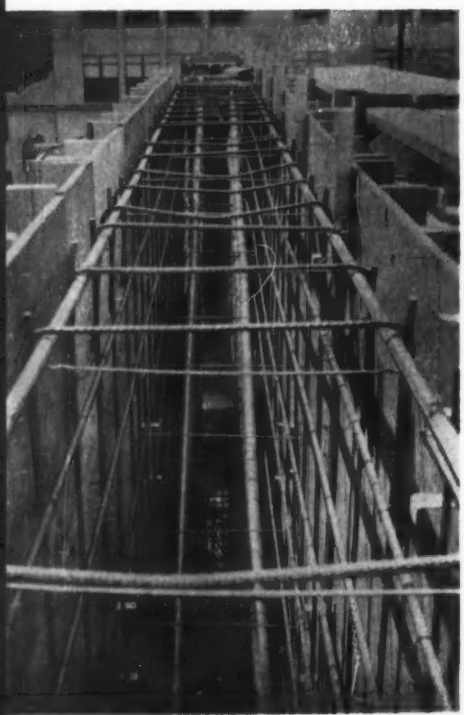
American Bridge Division of United States Steel

USS

An unusual system of four intersecting, post-tensioned girders supports the roof of a 117-ft-square museum in Utica. To insure that the four girders act together, the contractor had to pour them monolithically with high quality, 5,000 psi concrete.



Exterior Roof Girders Require Good Concrete Work



REINFORCING—Each 22-in. wide girder contains a maze of steel rods. In addition to regular reinforcing bars, each girder contains 14 conduits for post-tensioning cables.

A UNIQUE prestressed concrete building, now taking shape in Utica, N. Y., represents a lot of construction know-how on the part of the contractor, the George A. Fuller Co. of New York City, who is translating an unusual structural idea into finished concrete.

The building is the $2.5-million Munson-Williams Proctor Institute, Utica's newest art gallery. From a construction point of view, the most unusual feature of the structure is the way the roof is supported.

Four post-tensioned concrete girders (two each way) span the 117-ft square building above the roof. They are supported at the ends by eight exterior columns. The four girders intersect at four points to form a two-way lattice system that carries the entire roof and leaves the interior of the building free of columns.

Because the four girders are intersecting, they have a strength and stiffness equal to eight parallel girders of the same size. But to achieve the monolithic effect, Fuller had to pour the 350 cu yd of concrete for the four girders in one continuous operation.

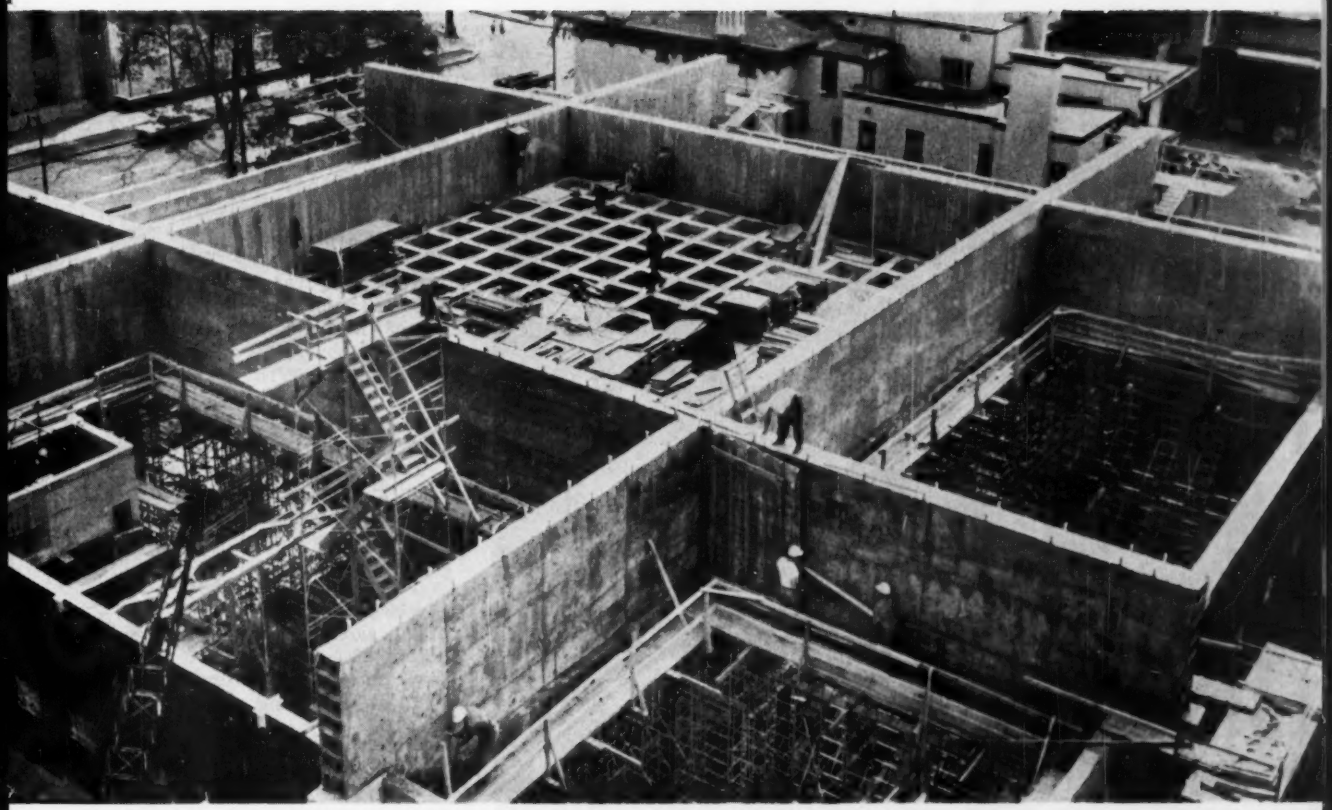
In addition, Fuller had to meet some exacting concrete specifications. The designer, Lev Zetlin of New York City, wanted:

- Concrete strength of 5,000 psi at 28 days.
- A 3-hr delay in the initial set of the concrete to insure a completely monolithic pour.
- Good workability to prevent voids and honeycombs in the narrow flanges of the girders and around the complex network of reinforcing steel and post-tensioning conduits.
- Early development of creep so that the girders would attain most of their deflection during the early stages of construction.

Concrete Design

To meet the concrete specifications, the Pittsburgh Testing Laboratory, who were responsible for the concrete design, developed a 5,000-psi mix that weighed 144 lb per cu ft. The mix contained 668 lb of Type I portland cement, 1,240 lb of sand, 550 lb of No. 1 size stone and 1,280 lb of No. 2 size stone.

To increase the workability without affecting the water-cement ratio, they added ¼ lb of Pozzolith to the mix. This reduced the water required by 20%



POUR COMPLETED—Workmen strip side forms from girders after 48 hr. In about two weeks, concrete will be strong enough for prestressing crew to apply post-tensioning.

to 32 gal and resulted in concrete with a 3½-in. slump.

A similar mix with a 2½-in. slump was designed to be placed during the later stages of the pour. This was to provide for an equal rate of hardening for the whole pour.

The consultants thoroughly pretested the concrete mix. They also conducted tests during the pour. They cast four test cylinders for every 80 yd of concrete poured. The compressive strengths averaged 4,200 psi at seven days, 4,985 psi at 14 days, and 5,665 psi at 28 days. The strongest cylinder tested indicated 6,230 psi at 28 days.

The consultants also ran modulus of elasticity tests on the concrete to determine the probable deflections of the girders.

Complex Girders

Each roof girder is shaped like an inverted "T", 124 ft long and 11 ft high. The web of the girder, which will be exposed above the finished roof, is 22 in. wide. The flanges, which support the roof slabs, are 6 in. wider than the web on each side, making the total girder width 34 in. at the bottom. A girder weighs 180 tons and requires 90 cu yd of concrete.

There are 14 post-tensioning cables per girder. Each cable consists of 25 individual steel wires ¼ in. in dia. The cables are contained in flexible conduits, anchored at each end and hung in the shape of a parabola. The girders contain ½-in. regular steel reinforcing in addition to the prestressing cables.

The girder system partially supports a 30-ft wide balcony that hangs 18 ft below the roof. Four 2½-in. steel rods threaded into each girder provide overhead support for the balcony. The rods went into 4-in. sleeves cast into the girders.

Forming the Girders

After the walls and eight exterior columns were poured, a crew built the girder forms. Actually they ended up with one complex single form, because the four girders were to be poured together. Shoring underneath supported the formwork.

Two crews and two cranes began placing concrete at 8 am. They started in adjacent corners and worked across the top of the building. At 5 pm another crane

POURING CONCRETE —Crew takes special care when placing concrete at corners and intersections so that entire pour will be monolithic. Two cranes with 1-yd buckets placed 22 yd per hr on average.

EXTERIOR ROOF GIRDERS . . .
continued

and crew joined the operation. The pour was completed shortly after midnight.

Nine 6-yd transit mixers from the American Hard Wall Plaster Co. of Utica hauled in about 22 cu yd of concrete per hr during the 16-hr pour. The cranes lifted the concrete to the roof in 1-yd buckets and placed it into the forms through elephant trunks.

The crews handled the concrete in small quantities and vibrated it thoroughly to insure a homogeneous structure and to make sure the concrete completely surrounded the conduits and reinforcing.

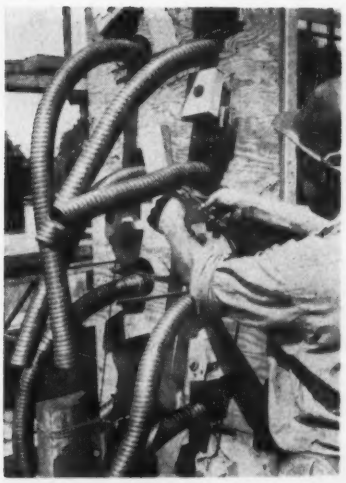
The side forms were stripped within 48 hr, and in two weeks the concrete was strong enough for post-tensioning.

Post-tensioning

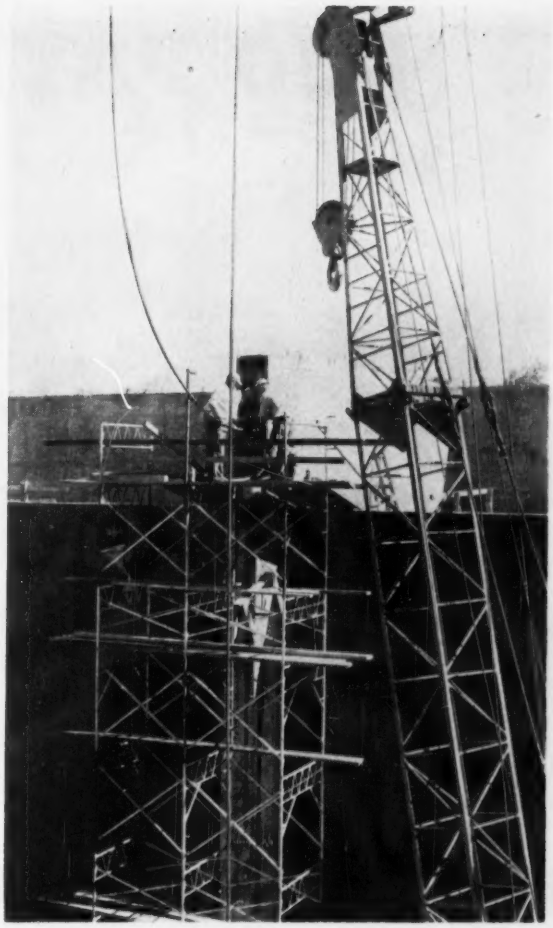
The 25 post-tension wires in each conduit were threaded after the concrete was poured to be sure no kinks or breaks had developed in the conduits. The 25 wires, banded together, were fed simultaneously into the ducts. A liquid detergent helped ease them through. The detergent had no chemical effect on the grout that was added later.

Stressing took about 2½ weeks. Starting at the bottom of a girder, workers applied half the stress to each tendon, working around the perimeter of the girders. They stressed the top tendons last. Then they filled the conduits with a sand-cement grout.

Tendon anchorage worked on the bearing principle. Two upsets at each end of the individual wires were set to bear against the anchorage hardware. The anchorage consisted of a split holding ring at the interior upset and a split-cone fitting inside a stressing adapter at the ex-



PLACING CONDUITS —Man wires conduit in place prior to pouring the concrete for the girders. Cables were not placed in the conduits until after the pour was complete to prevent damage.



THREADING CABLE— After concrete in girders has set, crew with crane feeds the 25-strand cables through the conduits. A liquid detergent, which does not affect grout, is used to lubricate cable.

treme-end upset. Threaded to a pulling rod inside a hydraulic ram, the adapter transmitted the jacking force to the tendon and tensioned it.

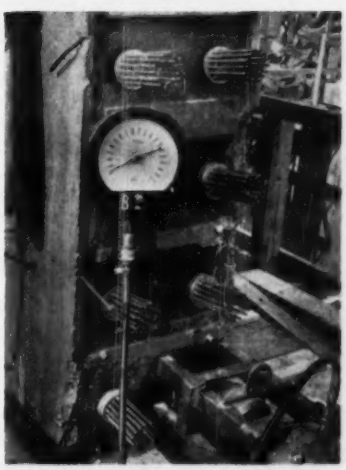
Each tendon had to maintain a final load of 175 kips. But to compensate for the creep in the steel, they were stressed initially to 206 kips. During the actual tensioning, a force of 218 kips was applied to overcome friction. Then the tendons were released to 206 kips and anchored. Gradually the force in the tendons will drop, at an ever-decreasing rate, toward the specified 175 kips. It never will actually reach 175 kips.

Before the concrete was poured, the centers of the girder forms had been jacked up 2 in. The stressing of the tendons added a further ½ in. to the camber. The extra ½-in. rise was enough to lift the girders off the shoring so it could be removed easily.

When the balcony and roof slabs are added, the girders will deflect downward 1½ in. Within a year, the 720-ton roof assembly will gradually descend the remaining 1 in. to become horizontal.

Stressing the tendons lengthened them by 8½ in. and shortened the girders by ⅛ in. at each end. To prevent cracking the walls during this process, two 18-in. milled, highly polished, and lubricated steel plates were set at the points where the girders rested on the column. One plate was embedded in the columns. the other in the girder. After stressing was complete, and the girder had assumed its final length, the plates were welded together and sealed against exposure.

For Fuller, Jack Madden is project supervisor, and William Gardner is engineer. Supervising architects are Bice and Baird of Utica. Pre-Stress, Inc., of Albany, N. Y., is the prestressing subcontractor.



POST-TENSIONING — Jack starts at lower conduit to apply 218 kips prestressing force to cables. Girder shortens ⅛ in. during process. To prevent damage to walls, girder slides on steel plate.

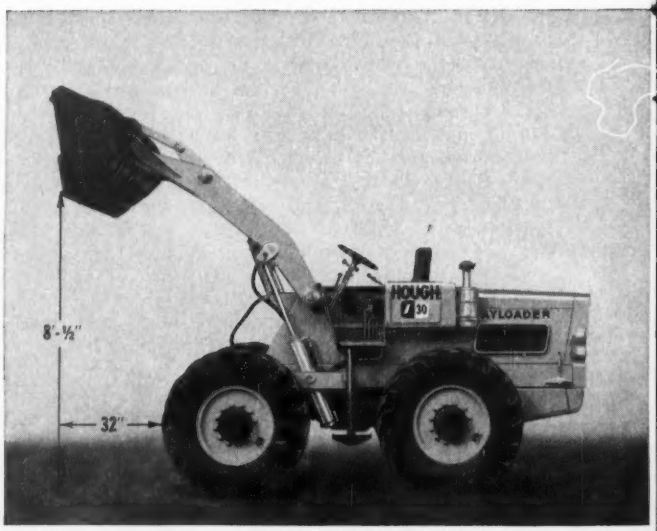
New H-30 PAYLOADER®

COMPLETELY NEW WITH FOUR-WHEEL DRIVE

This all-new tractor-shovel is the smallest "PAYLOADER" ever made with 4-wheel drive. It has an operating capacity of 3,000 lbs. and is available with 1 cu. yd. bucket.

In spite of its compact size and modest price the Model H-30 has the latest improved features and refinements of the larger "PAYLOADER" units and has many performance advantages not found in any other machine.

If you want all the advantages of Hough 4-wheel drive performance and value to fit a tight budget ask your "PAYLOADER" Distributor to show you the Model H-30.



MORE POWER • MORE REACH AND MORE DUMPING HEIGHT

FAR AHEAD OF ANY MACHINE IN THIS CLASS

Full of exclusive features for better performance

More Power: 77½ hp heavy duty engine provides more power than any comparable machine.

More Dumping Clearance: 8'-½" clearance under bucket edge, dumped — even more than some larger machines.

More Reach: 32" dumping reach ahead of front tires — twice the reach of any comparable machine.

More Reliable Brakes: 4-wheel hydraulic brakes instead of 2-wheel for equal braking forward or reverse. Sealed to keep out dust and dirt. Separate parking brake on drive shaft.

Full Power-shift Transmission plus torque-converter: Provides three speed ranges in each direction. All shifts in either direction can be made "on-the-go" with a flick of the fingers. No need to stop for any "range" shifts.

More Operator Visibility: New slope-down front end styling gives the operator full vision of the bucket digging action without leaning over the side.

More Safety: All boom structures are positioned ahead of and away from the operator. Standard ladder with hand rails makes it easy and safe for the operator to get on and off.

Closed, Pressure-controlled Hydraulic System: Oil reservoir is closed and pressurized to exclude dirt and dust — includes built-in cartridge type oil filter and a fine mesh strainer.

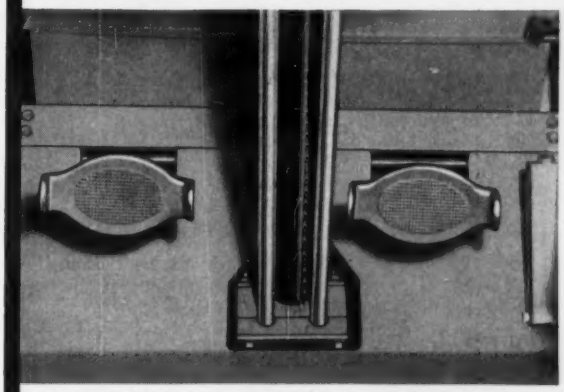
Positive Oil Cooling: Separate fan-cooled oil-to-air radiator assures positive cooling of the transmission and torque-converter oil.

More Accessibility: Compartment on left side with quick-opening cover provides easy access to the battery and all instrument connections. Fuel tank and transmission can be checked and filled from ground level.

Steering-axle Drive Disconnect: A lever in the cab enables the driver to disconnect the rear (steering) axle-drive for over-the-road travel or whenever 4-wheel drive is not needed.

HUSKY BOOM AND POWERFUL BREAKOUT

Boom arms of Man-Ten steel combine exceptional strength with light weight. A single long-stroke hydraulic ram with a high-leverage linkage to the bucket develops powerful bucket break-out action for tough digging assignments.



"OPERATOR'S CHOICE" BRAKE CONTROLS

This exclusive "PAYLOADER" service brake control provides the operator with instant choice of braking with the transmission engaged (left pedal) or disengaged (right pedal) without manual effort.

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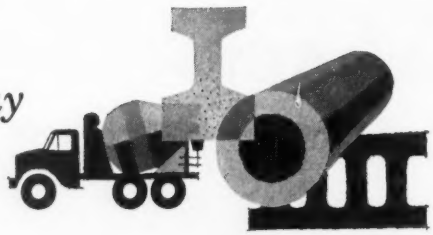
Here's the practical, proven way to Pre-mix!



THE SMITH TURBINE-TYPE MIXER

If you've wanted to pre-mix, but winced at the cost of converting — here's the answer to your problem!

The Smith Turbine Mixer — proved successful in over 100 installations — is a compact, lightweight, vibrationless mixer that can be easily installed in your batching operation.

If you're building a new pre-mix plant, use of the Smith Turbine permits lighter, lower, less expensive structures.

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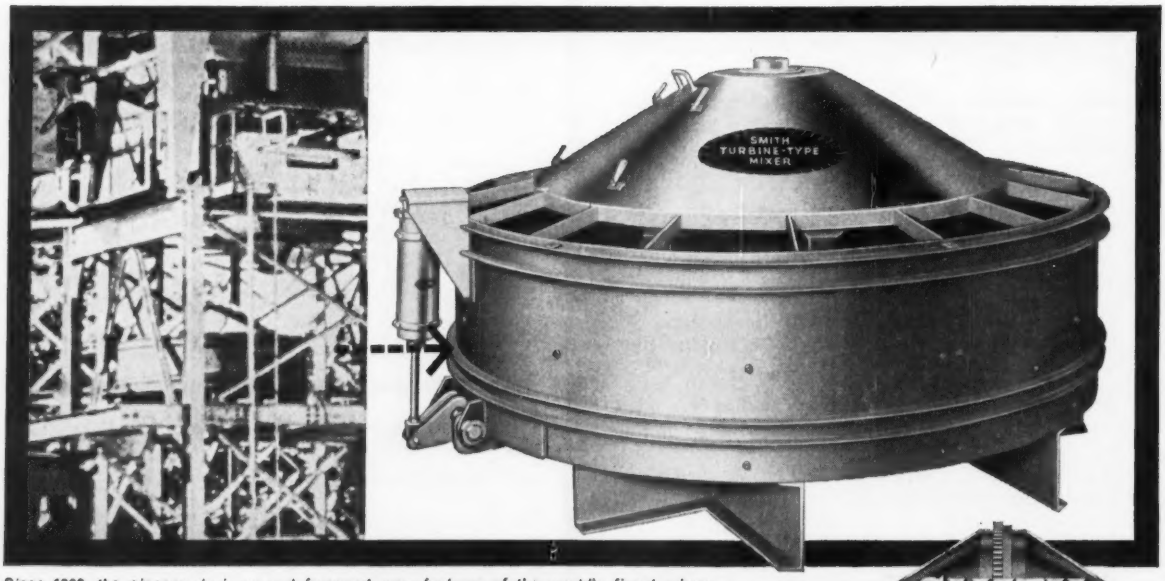
Cycle time with The Smith Turbine is fast enough to charge up to 20 trucks an hour. What's more, the Turbine can discharge in four different directions, allowing you to alternate wet and dry mixes — handle ready-mix, block, pipe, or pre-stressed batches all in the same machine.

Investigate the Smith Turbine. Write or call — we'll gladly tell you in detail how others are finding it the ideal way to beat competition while supplying higher-quality pre-mix!

Making dollars and sense in over 100 successful installations!



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Affiliated with Essick Manufacturing Company, Los Angeles, Calif.

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Construction Men in the News . . .

Pomeroy-Bates & Rogers-Gerwick

WALTER P. O'FARRELL, a newly elected director of J. H. Pomeroy & Co., Inc., of San Francisco, is general manager for the joint venture contractors building the Webster Street Tube that will extend across the bottom of the Oakland-Alameda Estuary of San Francisco Bay. The $16.6-million project is a joint venture of Pomeroy and Ben C. Gerwick, Inc., both of San Francisco, and Bates & Rogers Construction Co. of Chicago, Ill. Pomeroy is the sponsoring firm.

O'Farrell joined Pomeroy in 1955 as chief estimator. He was appointed a vice president in 1958. Before joining Pomeroy, he was employed for 32 years by the former Clinton Construction Co. of San Francisco.

Don Weaver is assistant general manager in charge of field construction for the tube. A general superintendent for Gerwick before his appointment, Weaver brings to the project a long history of construction experience in the San Francisco Bay area.

From March, 1953, to July, 1955, Weaver was project manager for the joint venture of Gerwick and Peter Kiewit Sons' Co. for construction of the underwater foundations for the Richmond-San Rafael Bridge across the north end of San Francisco Bay. He served with the Corps of Engineers in the South Pacific from April, 1943, to January, 1946.

The contractor's main task is to anchor the tube at the bottom of the navigable estuary, as deep as 80 ft below main sea level. Twelve tube segments, each 200 ft long, will be precast and floated to the job site. One segment, 783 ft long, will be cast in place. The tube will provide a roadway 24 ft wide for two-lane traffic.

Other job site personnel are Del C. Pedgrift, project engineer, and Rudy Buhlman, general superintendent.

ARBA

NELLO L. TEER, JR., is starting his second term as president of the American Road Builders' Association. He was reelected at the Association's 58th annual convention in Cincinnati. The term runs for one year.

When elected to the presidency last year, Teer, at the age of 45, was the youngest man ever to hold ARBA's highest office. Previously he had served as vice president of ARBA and president of its Contractors Division. He has also been president of the Carolina Road Builders.

Since 1952, Teer has been president of Nello L. Teer Co. of Durham, N. C., a construction firm founded by his father in 1909. The company is engaged in highway construction in the United States, Guatemala, and Uruguay.

The Association also reelected two vice presidents and elected two new ones. Reelected were John P. Moss, president of Moss-Thornton Construction Co., Leeds, Ala., and W. A. Bugge, director of highways for the Washington State Department of Highways. New vice presidents are Armand Keeley, president of the Prismo Safety Corp., Huntingdon, Pa., and George M. Foster, executive director of the Indiana State Highway Department.

R. W. Hyde, president of Hyde Construction Co., of Jackson, Miss., was elected president of the Contractors Division.

The Contractors Division reelected James E. Lambert of Lambert Construction Co., White River Junction, Vt., a vice president, and elected Ralph Heffner of Heffner Construction Co., Celina, O., to his first term as vice president.

Canadian Construction Ass'n.

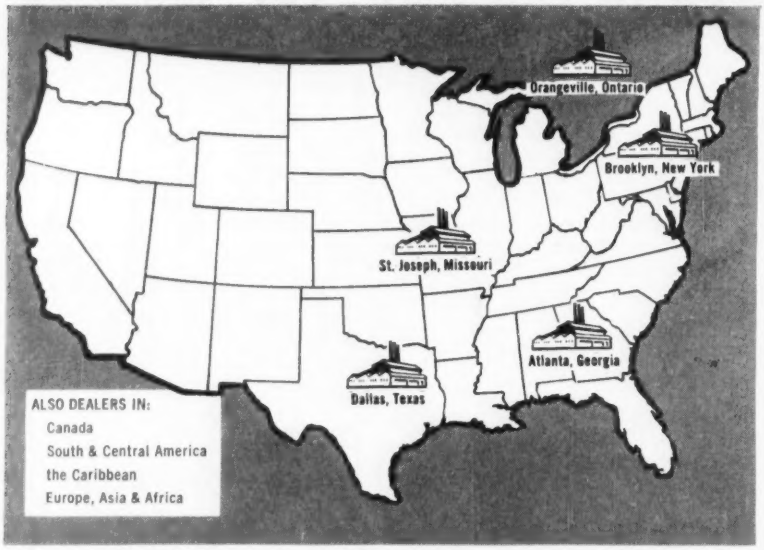
J. M. SOULES of Robertson-Yates Corp., Ltd., Port Credit, Ont., is the new president of the Canadian Construction Association. Elected at the association's convention in Calgary, he succeeds J. Eric Harrington of Anglin-Norcross Corp., Ltd., of Montreal, Que.

National Constructors

DONALD W. DARNELL is the new president of National Constructors Association, an organization of firms engaged in the building of major industrial plants. Darnell, who is board chairman of The Fluor Corp., Ltd., Los Angeles, will serve through 1960.

Robert L. Cashen, vice president of the H. K. Ferguson Co. of Cleveland, is the new vice president. New members of the executive committee are: H. E. Lore of Dravo Corp., Pittsburgh; George R. Collins of The Lummus Co., New York, and A. E. Somerville of Arthur G. McKee & Co., Cleveland.

More than 500 Richmond Dealers



Supplied by 5 Richmond Plants

Ready to bring you time and labor saving Richmond-engineered Form-Tys, Anchorages, Inserts and Accessories for any kind of concrete construction.

In addition to a line of more than 400 dependable, quality products for all phases of concrete form work and related jobs, Richmond has developed through the years a network of more than 500 dealers to service the concrete construction industry.

These dealers, supplied by five Richmond plants in the U. S. and Canada, stand ready to provide fast, continuous service no matter where your job is located or what your particular needs are.

Working in conjunction with Richmond field representatives and Richmond's Technical Department, these dealers can come up with the answer to your most difficult concreting problem.

For Form-Tys, Anchors, Inserts and Accessories you can rely on, contact your nearest Richmond dealer...we will be glad to give you his name and information about the full line of Richmond products. Write to:—

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Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distribution, sales personnel and other activities.

Distributor Appointments

Koehring Co.: The Kwik-Mix division has appointed The Chesapeake Supply and Equipment Corp. of Baltimore, and the J. D. Evans Equipment Co. of Rapid City, S. D., as distributors of the complete line of Kwik-Mix equipment. The Koehring division has appointed the Critzer Machinery Co. of Berea, Ohio, as distributor.

Warner & Swasey Co.: Moss Equipment and Supply Co. of Casper, Wyoming, has been appointed Gradall and Hopto dealer for fourteen counties in Wyoming.

Aeroquip Corp.: The following eight distributors have been appointed: Moorman Equipment Co. of Cedar Rapids, Ia.; Cummins Diesel Sales Corp. of Tampa, Fla.; L. E. Fox Co., Inc., of Kansas City, Mo.; Central Supply Co., Inc., of West Monroe, La.; Geheb Electric & Industrial Supply Co. of Muskogee, Okla.; Southern Supply Co. of Jackson, Tenn.; Hoener Equipment Co. of Quincy, Ill.; and CKM Industries of Cincinnati, Ohio.

Westinghouse Air Brake Co.: The Le Roi Division has appointed Atlantic Tug and Equipment Co. of Syracuse, N. Y., and Parker-Danner Co. of Hyde Park, Mass., as distributors for the Le Roi S2 line of large stationary air compressors.

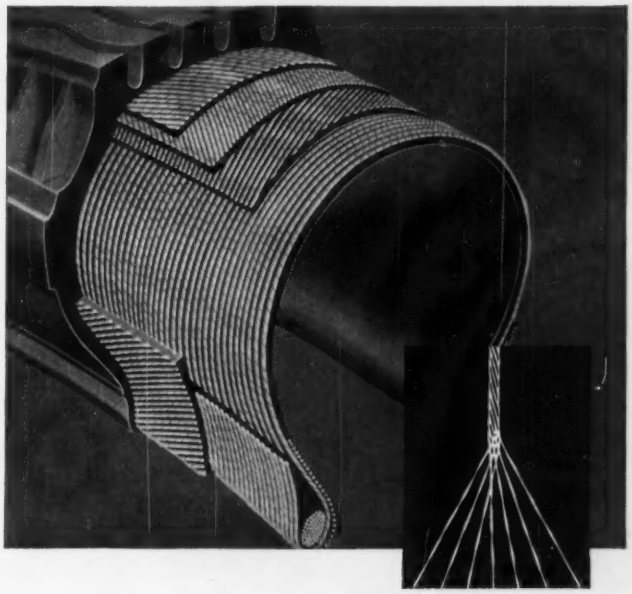
LeTourneau-Westinghouse Co.: The Dalworth Machinery Co. of Dallas, Tex., has been appointed distributor for the complete line of L-W earthmoving equipment in the Dallas area. Finch-Bayless Equipment Co. of Kansas City, Kan., has been appointed distributor in eastern Kansas and western Missouri.

continued on page 199

HERE'S WHY STEEL CORD TIRES

Go farther, Go safer, Cost less per mile

THAN ANY OTHER TIRE EVER MADE



MILLIONS of highway miles prove that truck tires made with Bekaert Steel Wire Cord deliver the longest, safest, lowest cost mileage . . . at least twice the life of tires made with rayon or nylon cord.

Both body and tread of every Bekaert Steel Wire Cord tire are "armor-plated" with approximately 50 miles of special high tensile carbon steel wire . . . doubling tire life! The running area of the tire is fortified with up to five bands of these virtually indestructible steel cords.

300,000 Miles—Original Treads

Tires with Bekaert Steel Wire Cord have run up to 300,000 miles and more on original treads . . . And they can be recapped again and again.

Run Cooler—Last Longer

Because steel dissipates heat rapidly, tires made with steel cords run from 40° to 100° F. cooler than fiber-reinforced tires. Steel cord tires do not overheat, stretch, "grow," or break down inside as do ordinary tires.

Unparalleled Blow-Out Protection

Dependable steel cord tires are as rugged as steel yet are remarkably resilient. They can successfully and repeatedly withstand punctures and impacts that damage conventional tires.

Carry Greater Loads

Tires made with Bekaert Steel Wire Cord require fewer plies, yet are measurably stronger than any other kind. One steel cord ply replaces from four to sixteen textile plies, depending upon size of tire and load.

Better Traction

Due to longer, larger "footprint," steel cord tires have up to 10% better traction than conventional tires, reduce power loss up to 25%.

Available Everywhere

Truck tires made with Bekaert Steel Wire Cord are available from leading tire manufacturers. Be sure you specify Bekaert Steel Cord, the next time you buy.

SEND FOR FREE BOOKLET, "EXTRA MILES" TODAY

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Please send me copy of your booklet "Extra Miles."

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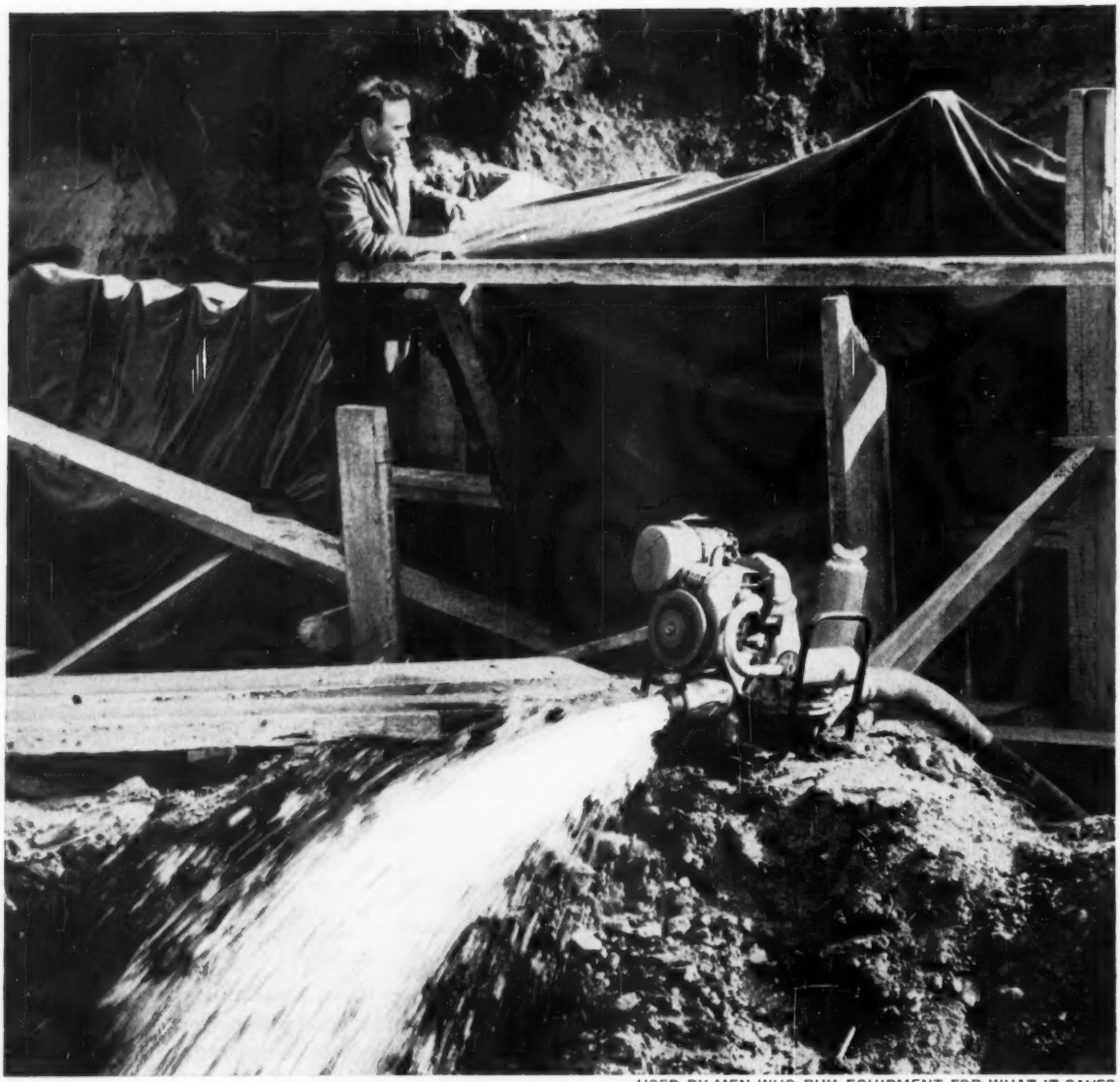

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It doesn't matter where you pump or what you pump, the Homelite Diaphragm Pump is the Time-saver and Money-saver for continuous heavy-duty work. Weighs only 120 pounds, complete with Homelite quick-starting engine . . . less than ½ the weight of most diaphragm pumps of equal capacity. You set it up anyplace, fast. You do your pumping, fast. Handles anything . . . water, sand, mud, muck, solids. Manual throttle control adjusts engine speed for full 5,000 G.P.H. capacity pumping or handling small seepage flow . . . gives greater fuel economy. Suction lift of 28 feet is guaranteed. You get total heads up to 50 feet, including friction. Flapper valves have special self-cleaning action to prevent clogging. For longer wear, gears operating in oil are totally enclosed. For steady footing, pump is mounted on vibration-proof spring skids. See it in action today.

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SALES AND SERVICE . . .
continued

On the Sales Front

American Machine & Foundry Co.: A. E. Richardson, Jr., has been appointed general sales manager of the DeWalt Division. He succeeds Truman Jones who was recently elected vice president in charge of special projects.

Stenberg Mfg. Corp.: Hessel H. Holland has been appointed district representative. He will handle the Flygt line of electric submersible pumps for the states of North and South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee.

General Metals Corp.: Ellsworth M. Smith has been named director of sales of the newly-formed O. E. M. Construction Division. He will devote his time to the new two-piece teeth for shovels, back-hoes, draglines, and buckets.

Simplex Forms System, Inc.: J. Arthur Jenkisson has been appointed to the recently created position of Director of Sales.

Earth Equipment Corp.: William Talmadge has been appointed general sales manager of the Everett Trencher Division.

Sika Chemical Corp.: John A. Heinen has joined the technical service department of Sika as an engineer. In his work he will reply to customer inquiries dealing with concrete technology and construction. E. Harold Nelson has joined the Boston district office as a sales engineer.

Yuba Consolidated Industries, Inc.: George R. Kritzer has been named Houston district sales manager for the company.

Westfall Equipment Co.: S. J. "Bud" Coffey has been appointed vice president and sales manager of the company. Westfall manufactures heavy, pneumatic-tired tractors and has an extensive distributor organization in 11 western states.

In the Main Office

U. S. Steel Corp.: Henry J. Wallace has been appointed president of the National Tube Division. He rapleces John E. Goble, who has retired. Robert E. Williams re-

USE LARGE FASTENERS BY

LARGE FASTENERS, 1-3/4" bolt diameter and larger, are our specialty! Standard and custom engineered nuts, bolts, threaded rods, turnbuckles, clevises, eye bars, loop rods are available to meet your large fastener needs.
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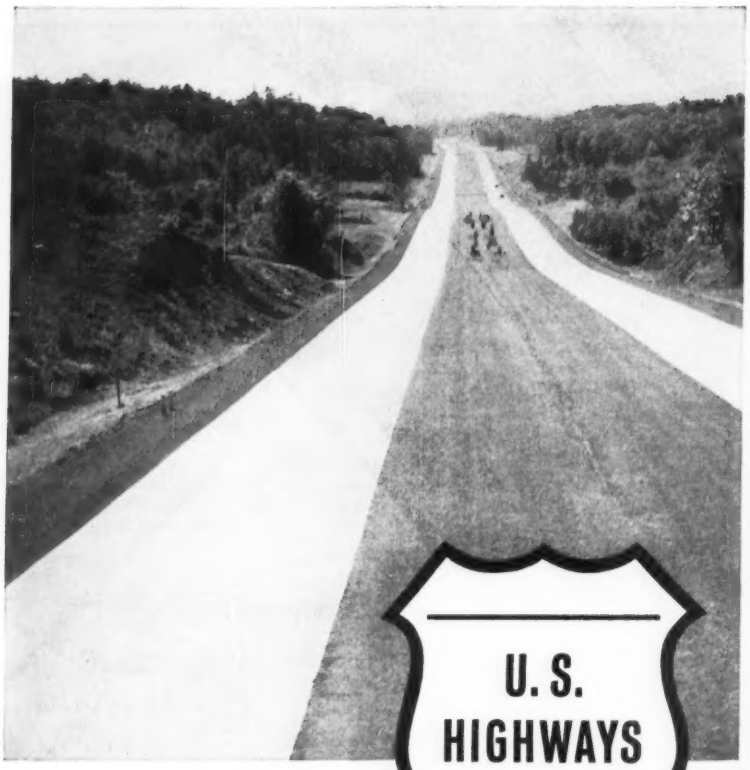


41,000 miles of road...

where can you use a dredge?

The Interstate Highway System offers challenges for road builders all across the nation... especially if the job involves building a road through a swampy area. Handling unstable earth materials calls for consideration of a hydraulic dredge. And cost-conscious contractors prefer Ellicott Dredges to obtain stable fill at the lowest cost per cubic yard.

Particularly applicable to road-building in low-lying, boggy areas, Ellicott "DRAGON®" Model Hydraulic Dredges dig, transport, and relocate water bound earth solids in one continuous economical operation. Designed to be transported overland from job to job by truck or lowboy, their matchmarked part construction permits easy field assembly, which eliminates long periods of downtime, a primary problem in meeting contract obligations.

Write for further information to Ellicott Machine Corporation, 1605 Bush Street, Baltimore 30, Md.

ELLICOTT DREDGES

ELLICOTT MACHINE CORPORATION, Baltimore 30, Maryland, U.S.A.; Timberland-Ellicott, Limited, Woodstock, Ontario, Canada; Dragues Ellicott France, Paris, France; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott de Mexico, Mexico City, Mexico; Ellicott Fabricators, Inc., Baltimore, Maryland; McConway & Torley Corporation, Pittsburgh, Pennsylvania.

Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering, design and construction services.

2295

SALES AND SERVICE . . .

continued

places Mr. Wallace as vice-president—sales. Truman H. Kennedy has been named vice president—operations to succeed Edmund G. Price, who becomes executive vice president of the division.

Air Reduction Co.: C. H. Glasier has been appointed executive vice president of Air Reduction Sales Co. He has been associated with Airco since 1936 and most recently held the position of vice president—gases.

J. I. Case Co.: At a recent board of directors meeting, W. J. Grede was elected president of the company to succeed Marc B. Rojtman, who has assumed the new position of special advisor to the president and the Case executive committee.

Associations

Associated Equipment Distributors: Jewel A. Benson of Benson Tractor Co. has been elected head of AED for 1960. Other officers elected were: senior vice president, Herbert J. Mayer of Western Machinery Co.; vice president, Richard R. Newlin of Newlin Machinery Corp.; vice president, Braxton Blalock, Jr., of Blalock Machinery & Equipment Co.; vice president, R. Boyd Somerville of Ontario Equipment & Supply Ltd.; and treasurer, W. R. Parnell of Construction Machinery Corp.

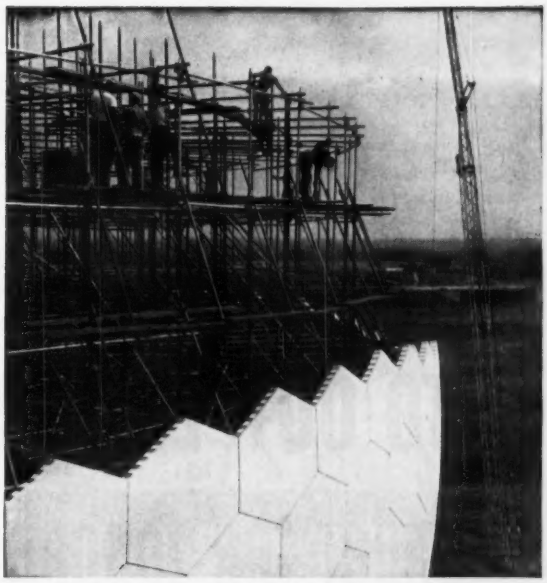
American Road Builders' Association: Eugene Weldon (Gene) Robbins has joined the Washington staff of ARBA as managing director of the Contractors Division. He succeeds W. Guy Gunn, who resigned to accept a position with the Associated Pennsylvania Constructors.

Special Mention

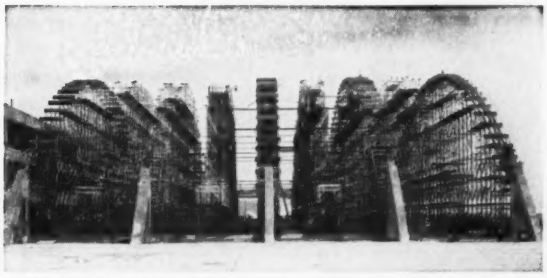
The Hertz Corp.: Hertz has entered the equipment leasing field. Walter L. Jacobs, president of the company, said they would emphasize leasing equipment associated with the use and leasing of trucks and cars, such as over-the-road trailers, mobile fork lifts, and bulldozers. But the company also will lease a wide variety of other types of equipment such as office equipment and machine tools.

Scaffolding and Shoring Methods

. . . by Patent Scaffolding CO.



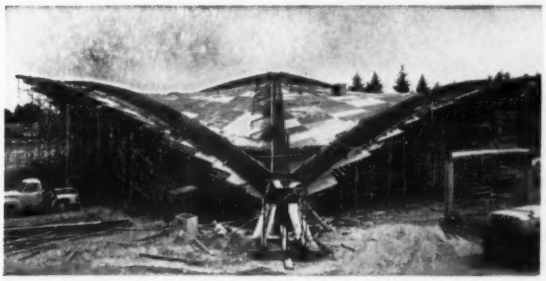
24 MILES OF SCAFFOLDING SPEEDS RADOME —A huge bowling-ball shaped structure, 140′ in diameter, is being erected at Moorestown, N. J., atop an Engineering Model Building to house and test a gigantic radar antenna system for the Ballistic Missile Early Warning System. During application of the six-sided plastic panels, 24 miles of "TubeLox" Scaffolding was erected to provide working platforms for the steel erectors, Cornell & Co. Radio Corp. of America, weapons system contractor for BMEWS under direction of the Air Force, is duplicating a part of a BMEWS installation to inspect and check radar gear.

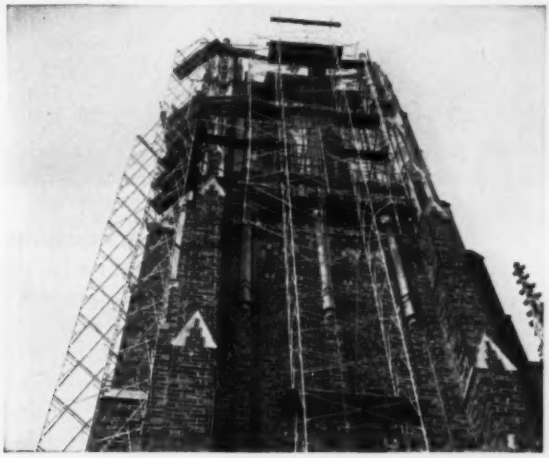


SAME SHORING FOR RIBS AND SLAB — Standard "Trouble Saver" Shoring frames, spaced 3′7″ to 5′ apart, support formwork for new, all-concrete Swissair Hangar #15, Idlewild, N. Y. 5 arched ribs are 180′ long, 28′8″ apart and vary from 2′6′ at arch peak to 4′9″ at base. Slabs are 5″ base to 3″. Walter Kidde Constructors, Inc., contr.

REPEAT PERFORMANCE—PS Co. scaffolded Duke Memorial Chapel, Duke Univ., Durham, N. C., for construction in 1931. For renovation this year, William Muirhead Const. Co., Inc., gen. contr. uses PS Co. "Trouble Saver" Scaffolding built to 205′ high to provide platforms for workmen in anchoring 68 loose stone spires around the bell tower.

SUPPORT FOR HYPERBOLIC PARABOLOID DESIGN —On the new hyperbolic paraboloid auditorium at Edward S. Ingraham H. S., Seattle, Sound Construction Co., gen. contr., finds standard "Trouble Saver" Sectional Shoring ideal for supporting the arched beams and slabs. In effect, the building is three butterfly roofs tied together to form one complete dome, 35′ high at center point.





Complete scaffolding equipment and engineering service offered through nation-wide sales offices or representatives. Look under Patent Scaffolding in the Yellow Pages for your nearest source.

SALES **RENTALS**

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. CM&E, Long Island City 1, New York

1550 Dayton St., Chicago 22 • Branches in all principal cities • 6931 Stanford Ave., Los Angeles 1

IN CANADA: CANADIAN PS CO., 329 DUFFERIN ST., TORONTO

JOB-ENGINEERED TO OUTPERFORM under the toughest conditions

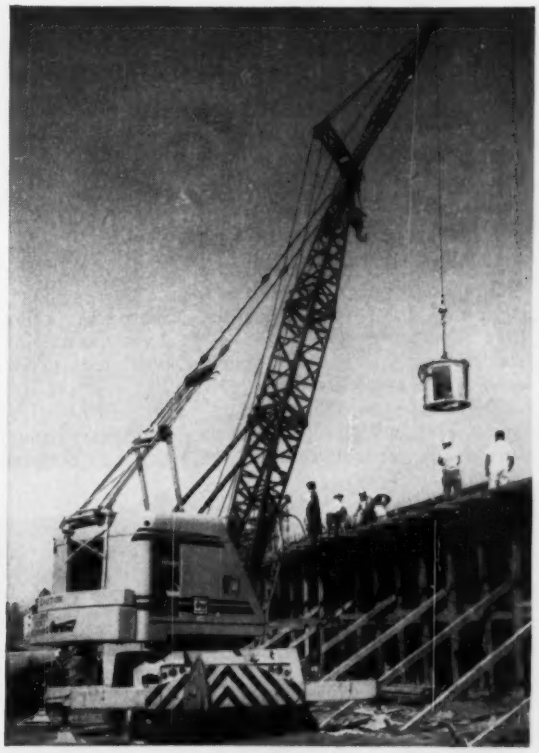
Gar Wood - St. Paul truck equipment outperforms in every way that adds up to more job profits... smoother, more efficient operation... longer, trouble-free service ... faster, easier maintenance. Since dependable, economical performance is a primary requirement for the profitable operation of your business, why settle for anything less than the finest truck equipment you can buy?

It's the most advanced and complete line of arm-type, front-mounted and under-body-mounted telescopic hoists with precision hydraulic systems for smooth, controlled dumping. Matching bodies, with exclusive built-in strength features, are available for every hauling need.

Your nearby Gar Wood - St. Paul distribuor, a specialist in service and specifications, can demonstrate why you can be sure of trouble-free dependability when you insist on Gar Wood - St. Paul truck equipment.

GAR WOOD-BUCKEYE DITCHERS give you advanced "extras" at no extra cost. Standard equipment on ladder-type ditchers includes the exclusive Hi-Lo traction shift that permits forward or reverse digging speed to be instantly increased or reduced 50% without disengaging main engine clutch.

GAR WOOD TRUCK CRANES have all the high-performance features to do more kinds of jobs... faster... more accurate... at lower cost. Modern, 3-shaft machinery design, arranged pyramid fashion, permits complete accessibility to every gear, drum, brake or clutch... allows quicker adjustments, faster conversions, easier maintenance.



GAR WOOD TRACTOR EQUIPMENT, matched to rugged Euclid tractors, is engineered for trouble-free performance under the biggest loads. Equipment includes front- and rear-mounted cable control units, Tipdozers, Dozecasters and Rippers.

GarWood
INDUSTRIES, INC.
Wayne, Michigan • Richmond, California

Construction Equipment News...

An Electric Motor in Each Wheel

A diesel-electric power combination drives a 55-ton dump truck up grades as steep as 15%. A 600-hp Cummins VT-12 diesel engine drives a generator that supplies power to the 41-ft long hauler. An electric motor, built by General Electric Co., drives each of the truck's wheels.

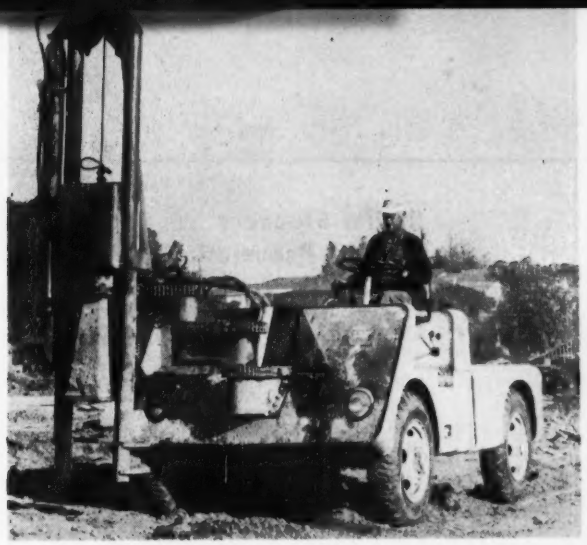
There are no transmissions, gear shifts, drive shafts, clutches, or friction brakes. But conventional automotive controls operate the truck to eliminate the need for special driver training. The unit has a steering wheel and a foot throttle. The brake pedal operates the electric motors and gives the rig dynamic braking. Parking and emergency brakes are hydraulic disk-type installations on all four wheels.

The Lectra Haul can make a 180-deg turn in a width of only 50 ft. It can dump its load in 23 sec.—**Unit Rig & Equipment Co., Tulsa, Okla.**

Motor Graders Offer Choice of Engines

Four motor graders have been added to the Huber-Warco line. An 83-hp International Harvester engine powers the 8-D grader—it is the smallest unit of the series. A 100-hp engine drives the 9-D, and a 125-hp unit powers the 10-D. Cummins, General Motors, or International engines are available for both of these graders. A 160-hp Cummins engine powers the 11-D—the biggest standard transmission motor grader ever offered by Huber-Warco.

A full constant-mesh transmission with six speeds in both forward and reverse is standard. Optional creeper gears give three additional speeds in both forward and reverse. These gears can be installed in the field if they are not purchased as original equipment. A single lever shifts all forward and reverse gears. Hydraulic booster steering that requires only 6 lb of pull on the steering wheel is standard.—**Huber-Warco Co., Marion, Ohio.**



Utility Rig Handles Many Attachments

The Ottawa Commando handles a variety of attachments. Two cranes are available with capacities of 4,000 and 7,000 lb and lfting heights of 21 and 17 ft respectively.

A 1,000-lb hydraulic hammer can break up pavements or tamp backfill over a 10-ft width. The Commando backhoe digs to a depth of 12 ft. The crane, hammer, and backhoe can be mounted at the same time.

The unit weighs 9,200 lb and has a 100-in. wheelbase. A 4-cyl Continental engine powers it. It can creep or travel along the highway at any speed up to 35 mph. Either two or four-wheel drive is available.—**Young Spring & Wire Corp., Ottawa Steel Div., Ottawa, Kan.**

Wheel Tractor Mounts Loader and Backhoe

Ford loaders now can be mounted on Fordson tractors. The tractors also can handle backhoes or counterweight boxes for loader operation. An equipment hydraulic package operates the attachments.

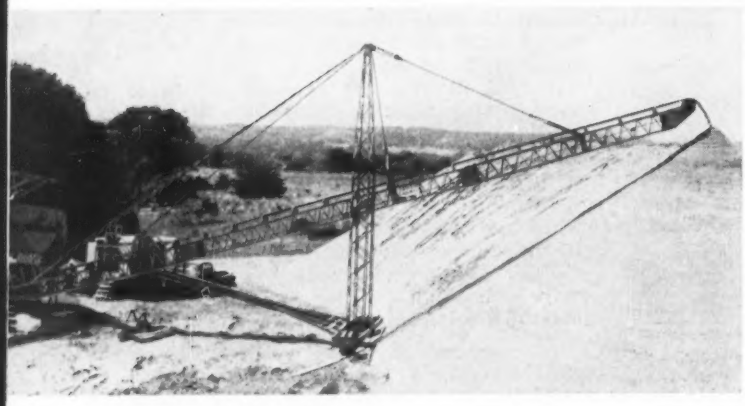
Lift capacity of the loader is 2,500 lb; it breakaway capacity is 5,500 lb; it can lift a load to a height of 11 ft. A special indicator tells the operator the exact position of the bucket at all times.

Bucket capacities are ⅝ and ¾ cu yd; a 1-yd light materials bucket is also available. In addition, the tractor can handle a fork lift, crane, dozer blade, or scarifier.—**Tractor and Implement Div., Ford Motor Co., Birmingham, Mich.**

Military Ditcher Goes Civilian

The Barber-Greene 750 rubber-tired ditcher was designed and manufactured for the Corps of Engineers, but now is available for civilian purchase. It is a bucket type ditcher with a vertical boom that can dig trenches up to 2 ft wide and 6 ft deep.

A diesel engine drives the 36,000-lb ditcher. It can travel over the highway at 27 mph. At the job site, the hydraulic drive gives the ditcher forward crowding speeds ranging up to 20 fpm. Power steering and hydraulic brakes are standard. — **Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.**



Radial Stackers Ride on Pneumatic Tires

A line of pneumatic-tired radial stackers ranges in length from 90 to 150 ft; available widths are 18 to 36 in. To move the stacker from one location to another, the wheels can be turned from a radial to a parallel position.

A cable suspension raises or lowers the discharge end while stockpiling. Either electric or mechanical power lift and power travel equipment is available.

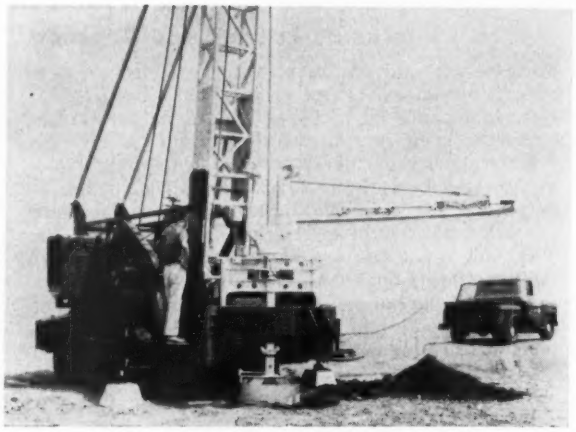
Finger-tip controls operate all stacker functions. Other equipment includes an anchor pivot and a radial receiving hopper. **—Kolman Mfg. Co., Sioux Falls, S.D.**

Crawler-Mounted Earth Drill Bores Belled Caisson Holes

The Calweld 500 is a rotating bucket type earth drill that rides to the job site on a crawler-mounted undercarriage. Either a gasoline or a diesel engine powers the 40,760-lb rig.

It takes two men to drill caisson pier holes, belled footings and piles, or to make test borings. The rig can drill holes ranging from 12 to 120 in. in dia and up to 200 ft deep. A telescopic kelly bar permits drilling to 90 ft without drill stems. The derrick is 42 ft long.

The dumping arm and stabilizers are hydraulically operated. A kelly bar crowd puts additional pressure on the drill for easier operation in tough materials.—**Calweld, Inc., 7222 E. Slauson Ave., Los Angeles 22, Calif.**



Caterpillar's First

A loader with a 2-yd bucket is the first of a line of Caterpillar wheel loaders. Power comes from either a gasoline or diesel engine delivering 105 net hp.

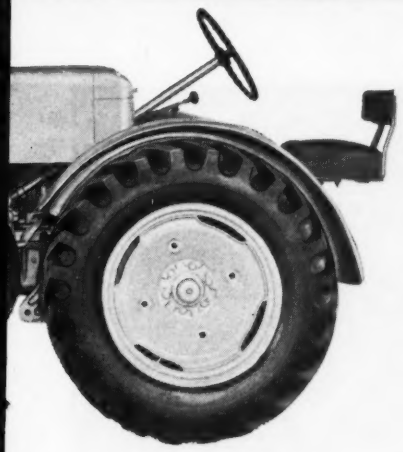
Dumping height of the No. 944 Traxcavator is slightly over 9 ft. The bucket tips back 41 deg at ground level and 50 deg at maximum lift. The bucket cutting edges are self-sharpening.

Hydraulically operated bucket positioner and lift knockout are standard. A 40-gpm vane type pump supplies hydraulic power; it is driven from an accessory drive direct-connected to the engine.

A planetary power shift transmission with two speeds in forward and reverse and a torque converter make up the power train. In addition, there is a manually shifted range selector transmission giving the machine a four-wheel-drive work range, or a two-wheel-drive travel range. Reverse speeds are 25% faster than forward speeds.

Two air-boosted foot brakes give the operator good control under various working conditions. The left pedal operates a valve that shifts the transmission into neutral. The right-pedal works a conventional brake. The center point steering system is hydraulically boosted.

continued on page 209



from any angle...

It's a new, better Tractair!

Le Roi's self-propelled air-compressor has been redesigned to give you easier operation, easier serviceability

Le Roi's famous Tractair — the most popular self-propelled air compressor in the world — is now available in a new design! It's packed with convenience, features and maintenance-reducing innovations that will make Tractair an operator's dream — and a contractor's favorite.

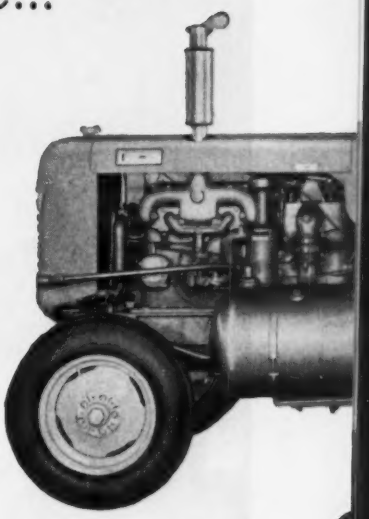
The 42-hp tractor delivers 125-cfm air power to widely scattered spots all over the job-site — over terrain where an ordinary compressor can't even be towed by truck! And when it gets there, you can park it on a hillside, in a ditch ... anywhere you want up close to the job, where short hose lines assure full power at the tool.

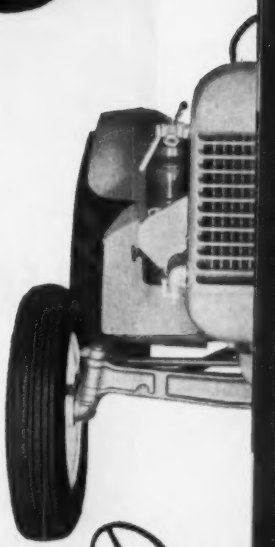
There's no dead time while this compressor waits to be towed — it moves itself!

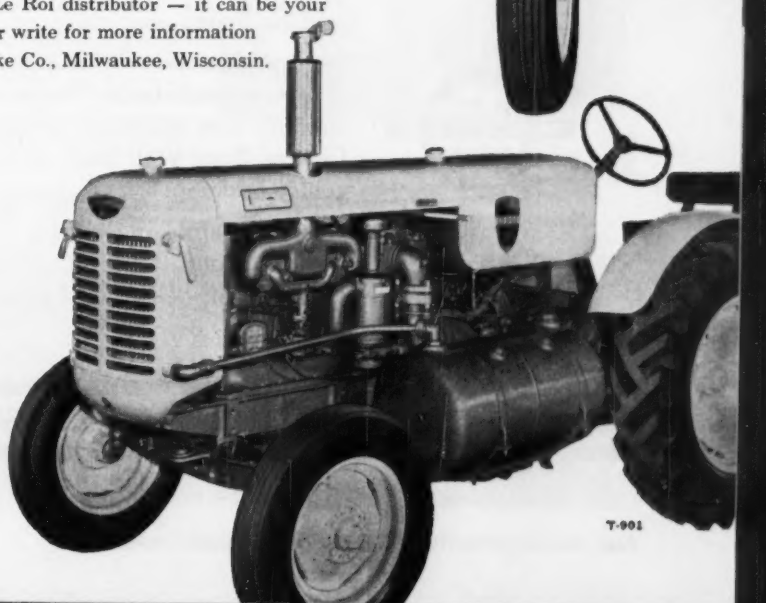
And look at the new features: an upholstered seat with back rest — no more backache-creating bucket; power steering* to increase easy maneuverability; a completely removable hood to speed servicing and cut down on finger-cramping maintenance; completely enclosed battery where it won't check or weather; conveniently grouped, read-at-a-glance control panel; easily-reached, lockable tool box big enough to hold a couple of sinkers or breakers; 12-volt ignition system for fast starts in any weather — all in a modern design that matches serviceability with good looks!

See this newly improved unit at your Le Roi distributor — it can be your hardest-working, best utilized machine. Or write for more information to Le Roi Division, Westinghouse Air Brake Co., Milwaukee, Wisconsin.

*Optional







LE ROI TRACTAIR AIR COMPRESSORS

PORTABLE AND TRACTAIR® AIR COMPRESSORS
STATIONARY AIR COMPRESSORS
AIR TOOLS

T-901

A Gym-Dandy Use for LACLEDE OPEN WEB STEEL JOISTS

A highly efficient type of construction was used for the modern new field house, O'Fallon Technical High School, St. Louis. The mammoth structure will house a gymnasium, auditorium and swimming pool.

Steel girders span the entire width of the building, leaving the floor area unobstructed by center columns. To provide maximum strength with minimum weight the roof was constructed with Laclede Open Web Steel Joists stabilized with continuous horizontal bridging.

General contractor for the project was Robert Paulus Construction Company, St. Louis, in cooperation with architects and engineers of the Board of Education, City of St. Louis.

STEEL JOIST INSTITUTE MEMBER SJI

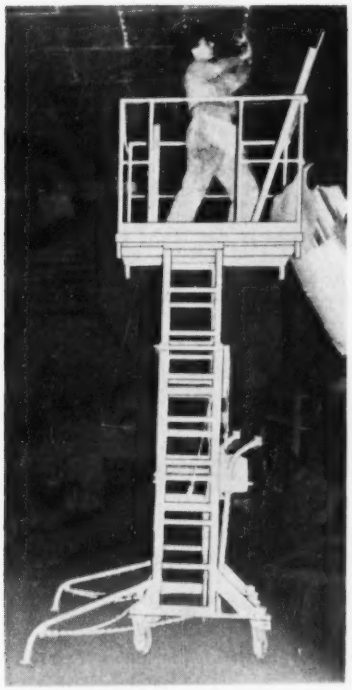
LACLEDE

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

Optional equipment includes a 2-yd side dump bucket and a 1,000-lb counterweight, a 3-yd light materials bucket, and a fiberglass cab. The gasoline powered model carries a $17,950 price tag, and the diesel model costs $20,350, both fob Peoria.

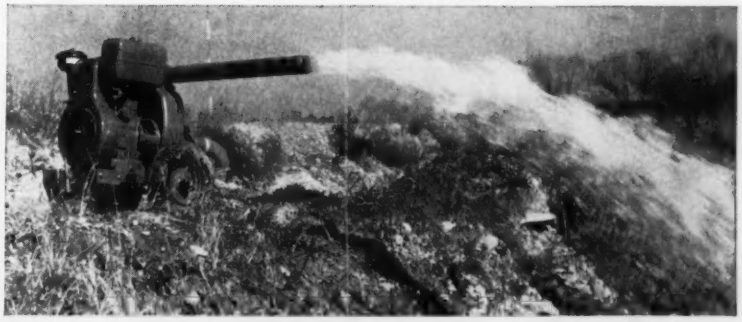
Two other models of the wheel Traxcavator will be available later this spring. The No. 922 with a 4-cyl turbocharged diesel or a 6-cyl gasoline engine will have a 1¼-yd bucket and a top speed of 32.2 mph. A 6-cyl turbocharged diesel engine will power the No. 966; it will handle a 2¾-yd bucket. — **Caterpillar Tractor Co., Peoria, Ill.**



Work Platforms

Overhead work can be handled from movable platforms that can be adjusted to the required height. When retracted, the platform is 6 ft 8 in. high and will pass through a 32-in.-wide door. Maximum elevations when extended are 11, 16, or 20 ft. The platform itself is 2 ft wide and 4 ft long.

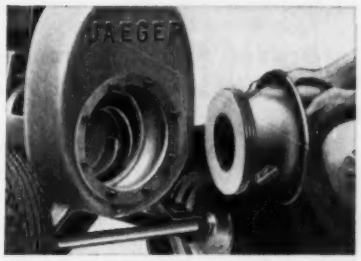
A hand winch with a self-locking worm gear held by two steel cables raises or lowers the platform. It rolls on casters; when in position, outrigger braces prevent rolling or tilting.—**Atlas Industrial Corp., 849 39th St., Brooklyn 32, N.Y.**



It's Jaeger's new 3″ pump... the "3PN"

Out-performs all previous models

Pumps all the water a 3″ suction hose can handle. With 4″ suction hose pumps 28,000 gph at 10′ lift. Sure-priming is correspondingly fast, at all practical lifts.



AND LOOK HOW EASY TO MAINTAIN!

Suction chamber and liner are removable for quick adjustment, rotation or replacement of liner plate. (New Model 3XPN offers same feature in a smaller pump.) See your Jaeger distributor or send for catalog.

THE JAEGER MACHINE CO., 800 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • MIXERS • PAVING, SPREADERS and FINISHERS

CONTINENTAL RED SEALS ARE ENGINEERED TO FIT THE JOB

Rarely will you find an item of industrial, construction or road building equipment that won't run best and cheapest on Continental Red Seal power. The reason lies in specialization—in Continental's long-standing policy of engineering each model precisely to the work to be done. Whatever the machine . . . whatever its job . . . you can bank on it for abundant power at the speeds consistent with low fuel and upkeep cost.

Continental's ruggedness and rightness of design are helping to build prestige for more and more of the leading builders of specialized power equipment. It's wise when buying equipment of this type, to choose a make with dependable Red Seal power—power backed by specialized experience dating from 1902.

●

SERVICE AND PARTS AVAILABLE EVERYWHERE

CONTINENTAL MOTORS — Power Tested on the Nation's — AMERICA'S STANDARD

Continental Motors Corporation

MUSKEGON • MICHIGAN

Grader Attachments Cut Ditches, Pick up Windrows

Caterpillar motor graders equipped with an Ulmac disk-beam attachment and a loader with an off-center hitch can cut ditches, clean up shoulders on highways, and load the windrowed material over the truck cab in one pass.

A curved disk on the U-200 disk-beam attachment cuts the material and directs it to the grader blade. The angled grader blade moves the dirt from the shoulder and leaves it in a windrow on the roadway. A box-beam, attached to the grader, supports the disk. Standard motor grader scarifier controls operate the attachment.

Behind the grader is the U-300 loader (CM&E, Nov., 1959, p. 181). A new type swinging offset hitch centers the loader on the windrow and permits simultaneous grading and loading. On previous models, the grader straddled the windrow, and the loader picked up the material directly behind the grader. — **Ulmac Equipment Co., Inc., El Paso, Ill.**

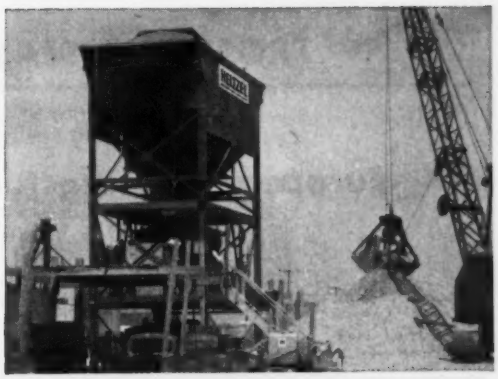
Sand would scrape the markings off <u>most</u> tapes!

This is Lufkin's Super HiWay®. Engineers and layout men swear by it. The big reason: it has a Chrome Clad® line that defies defacement . . . by sand, mud, grit or years of use.

Raised markings and protective borders are a part of the tape itself . . . and will last as long. The line is .025″ thick with a rust-resistant base coat and a series of electroplatings, topped by a final layer of tough chrome. It's the most durable tape line made.

Available in 100′, 200′ and 300′ lengths, with or without reels. Three choices of end markings plus chainman's conversion rule.

THE LUFKIN RULE COMPANY
TAPES · RULES · PRECISION TOOLS



Heltzel 150 ton, 3 compartment, unitized type 200 aggregate bin. Three, 50 ton compartments. Twin, 1½ yard automatic batchers.

In South Carolina, too . . .

the move is to Heltzel's unitized, portable batch plants

Contractors across the country are taking advantage of Heltzel's easy to set-up and dismantle, fast, accurate batch plants . . . designed to fit each specific requirement.

Simplified design includes easy-to-handle sections that require only a minimum crew and standard crane equipment to set-up in record time. Factory assembled elevators, batcher and bin sections, may be shipped as complete "package" units—easily set in place—accurate—fast-operating and rugged.

It will pay you to investigate Heltzel Batch Plants for maximum versatility and cost-reducing operation. Write for free data containing complete details.

Heltzel E-3, 357-390 barrel, unitized portable cement batching plant. Automatic twin batchers. 671-742 bbl. single compartment, portable cement tank.

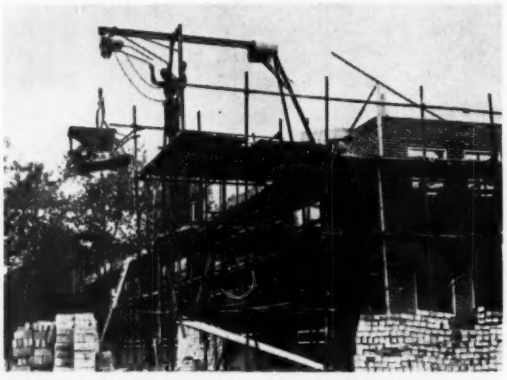
HELTZEL STEEL FORM AND IRON CO.
WARREN, OHIO

FROM OVERSEAS . . .

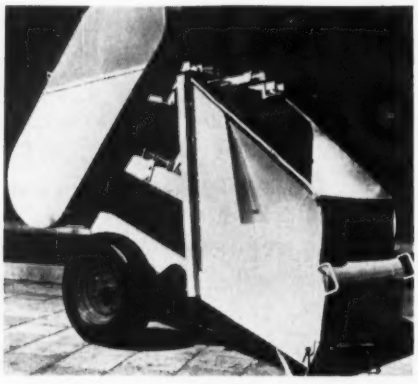
European Manufacturers Introduce a Variety Of New Machines

SWEDEN—Volvo trucks are available in three different sizes with gross combination weights ranging from 40,000 to 68,000 lb. Six-cylinder, four-cycle Volvo diesel engines power all models. The engines are rated from 90 to 185 bhp and have a compression ratio of 17 to 1.—**Volvo Distributing, Inc., 357 Wilson Ave., Newark, N.J.**

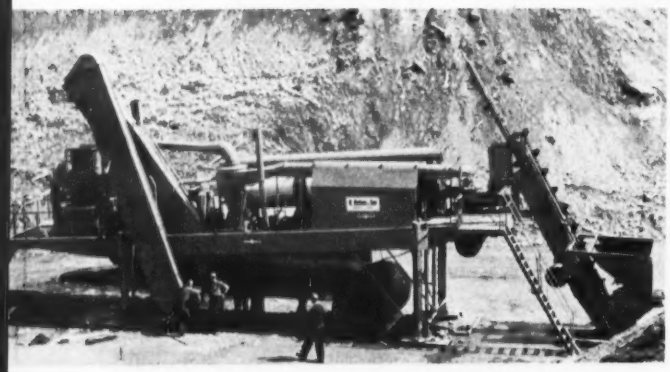
GREAT BRITAIN—A torque converter power shift transmission gives the Merton Frontloader two speeds forward and one in reverse. A 62-hp Fordson diesel engine powers the loader.—**Merton Eng. Co. Ltd., Faggs Rd., Feltham, Middlesex.**



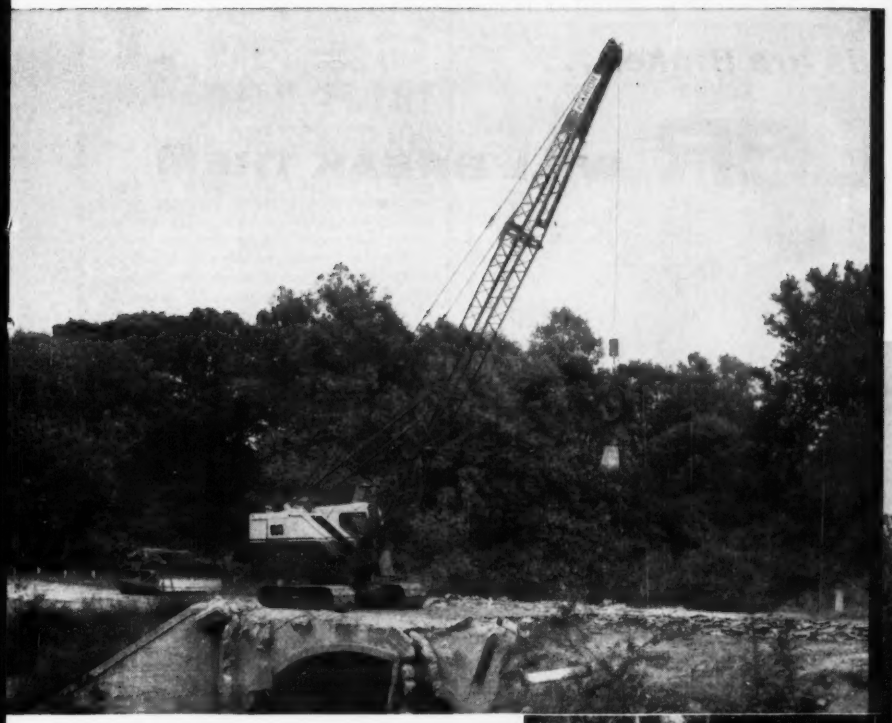
NETHERLANDS—A 1½-hp electric motor powers a light materials lift that can handle 550 lb at speeds up to 165 fpm. One man can carry the parts and assemble the lift in about 15 min.—**A. van den Pol N.V. Langestraat 27, Nijkerk.**



NETHERLANDS—A jet conveyor with a 10½-hp motor throws material at a rate of 200 tph over a distance of 82 ft or to a height of 32½ ft.—**Zelandia Handelmij N.V., P.O.B. 447 Rotterdam.**



DENMARK—The Via Nova portable asphalt plant consists of a two-compartment cold aggregate feeder, cold elevator, drying drum with burner and accessories, cyclone precipitating device, and an asphalt boiler. The plant produces 15 to 25 tph depending on the moisture of the materials. Either a 6-cyl, 75-hp diesel engine or an electric motor powers the unit.—**H. Nielsen & Son Maskinfabrik A/S, 37 Aldersrogade, Copenhagen N.**



SPEAKING OF VERSATILITY

A versatile 3/4 yd. Marion 35-M is making one bridge-building specialist's job easier on a state highway bridge contract in Indiana. From the wrecking of the old to the erection of the new spans only this Marion and a bulldozer were used.

Ease of conversion is the key to this machine's versatility. Split lagging lets the operator switch front ends in a matter of minutes.

Smooth, cool performance is assured through big-diameter swing clutches which dissipate heat quickly... even in demanding dropball work.

There are a host of other reasons why a growing number of contractors are looking to Marion for their bridge building crane equipment. Your nearest Marion distributor has the full story.

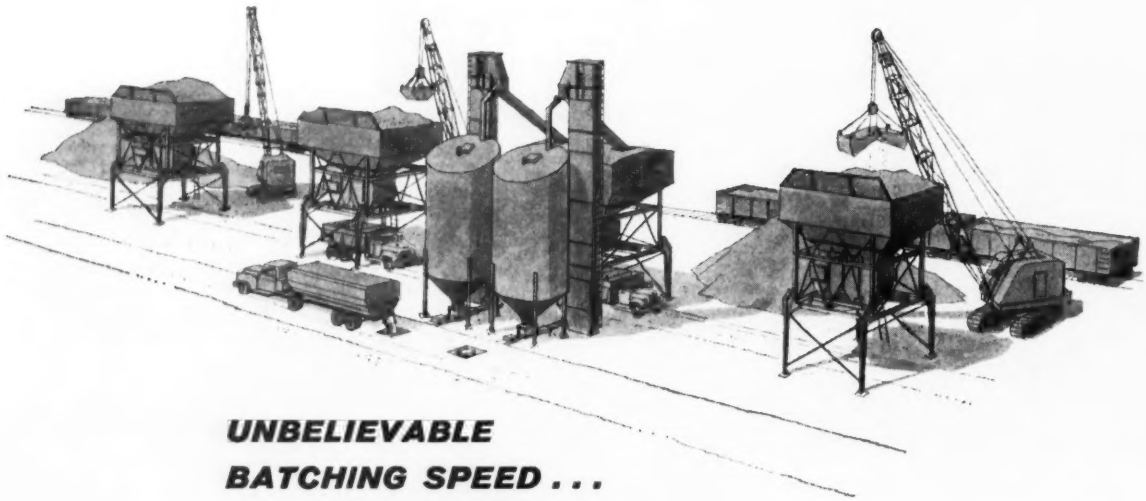
You get **MORE** *with* **MARION**

Marion Power Shovel Company, Marion, Ohio

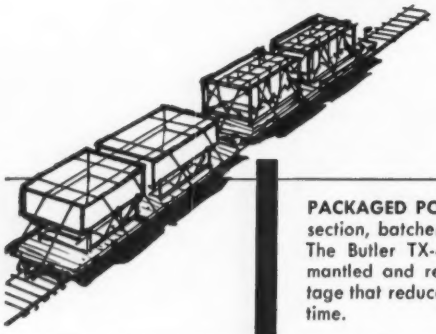
A Division of Universal Marion Corporation

As Batching Records are Broken . . .

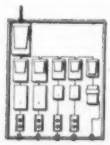
BUTLER WILL BREAK THEM



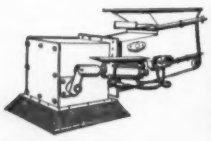
UNBELIEVABLE
BATCHING SPEED . . .
EXTREME ACCURACY . . .
PACKAGE PORTABILITY . . .



PACKAGED PORTABILITY (bin in one section, batcher in another)
The Butler TX-4 can be rapidly dismantled and re-erected — an advantage that reduces profit-robbing downtime.



SERVICE ENTRANCE PANEL
This comes in a weatherproof steel cabinet. All circuitry is installed ready for use so you have none of the usual expense of field wiring.



AIRFLOMATIC CEMENT FEEDER
Precision feeding, day after day, is yours with the Butler Airflomatic Cement Feeder. No moving parts except a stream of air on which the cement literally rides.

The past year has seen new world's records established and broken — perhaps half a dozen or more — and all with the BUTLER TX-4 Roadbuilders Plant.

Yet all those records are far, far short of the production levels possible with the TX-4. That's why when the next record comes along, it will be set with BUTLER equipment.

There are many reasons. Faster, fool-proof automation . . . batching faster than trucks can be spotted. Split-pound accuracy with no mistakes.

And portability that puts fat, extra savings in the roadbuilders bank account.

BUTLER BIN COMPANY

949 Blackstone Avenue • Waukesha, Wisconsin

3106

8 CONTRACTORS PRE-DEWATER WITH FLYGT on BIG SEWER JOB

On a $23,180,000 sewer bond issue in Orange County, California, 8 separate contractors won their race against time and severe ground water intrusion with Flygt Electric, Submersible Pumps. The 19-mile Miller-Holder Trunk Sewer job experienced water intrusion from the first excavation, and it threatened to slow work to a crawl and run costs to astronomical highs. Key to the final success of the eight separate but simultaneous contracts was efficient, economical pre-dewatering developed jointly by Gridley Equipment Co. and Stanco engineers. Featuring more than 40 Flygt Electric, Submersible Pumps, the pre-dewatering systems drained and kept dry ditches along the right-of-way at substantial savings over other dewatering methods. Typical of contractor comments on the system:

"This system really does the job," declares Pete Barrett on the J. S. Barrett Co. $2,667,-727 contract for installation of 5½ miles of 78-inch line. "You just drop Flygt Pumps in the hole, turn them on and make only periodical inspections. They keep the ditch dry at realistic cost with none of the trouble normally experienced with suction-type pumps."

"These Flygt Pumps give you a chance to go home and sleep at night," says N. A. Artukovich on his company's $1,846,870 contract for placement of more than 5 miles of 51- to 63-inch pipe. "The Flygts require little attention and keep the pipe and ditch dry despite continuous intrusion conditions. The pumps handle a lot of solids."

Flygt Electric, Submersible Pumps range from 1½" 85 gpm to 8" 3100 gpm capacity. Heads to 220' — higher in tandem. Designed and built for tough applications, they are adaptable to any dewatering job. Flygts run continuously with little attention, handle a high degree of solids, need no priming, are easy to handle and service. Ask today for literature and an on-the-job demonstration.

FLYGT

PUMP BETTER ELECTRICALLY — USE FLYGT!

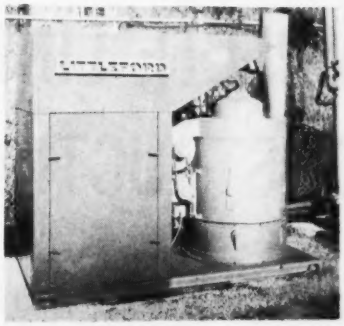
WESTERN SALES & SERVICE

Stanco

MFGS. & SALES INC.

1666 Ninth St. (Corner of Olympic & Ninth) Santa Monica, California

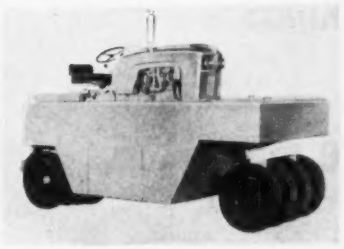
EQUIPMENT NEWS... *continued*



Hot Oil Heater Works 'Round the Clock

A 24-hr timer on the Littleford hot oil heater permits automatic operation 'round the clock. A relief valve on the pump protects the heater against excessive oil pressure, and a pressure control automatically shuts it down in case of leaks.

The unit raises the temperature of heating oil to 450 deg. It is designed for use with asphalt plants and prestressed or ready-mix concrete operations. A vertical down-fire coil-type furnace permits forced air combustion. No shelter or protective building is necessary for outdoor operation. **—Littleford Bros., Inc., 457 E. Pearl St., Cincinnati 2, Ohio.**



Nine-Wheel Roller

A nine-wheel, self-propelled roller has been announced by Western. Fully ballasted, it weighs 30,000 lb; load per wheel is 3,140 lb. Both the front wheels and the drive wheels oscillate. Sprinkler bars, cocoa mats, and lights are optional.

A 57-hp, 4-cyl gasoline engine powers the 12-SP roller. It is equipped with a torque converter, reverse shuttle drive, five-speed transmission, and hydraulic power steering. The drive chain is fully enclosed. — **Western Equipment Div., Douglas Motors Corp., Milwaukee, Wis.**

BUILD A CONCRETE MIXER LATELY?

Of course you haven't. It's cheaper and more practical to buy one made by a company whose business it is to make them! You get more for your money. The same is true about pre-fabricated, ready-to-use UNI-FORM Panels compared to wood forms contractors build themselves. For the complete story write:

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MAYO Tunnel Cars

. . . feature practical designs and rugged construction. All cars can be equipped with Mayo's safe, automatic couplers.

- **Side Dump Car** (shown) has 2½ cu. yd. capacity. 24" gage.
- **Rocker Dump Car.** Ideal for sticky muck or wet concrete. 1 cu. yd. capacity 24" gage.
- **Tunnel Car.** Box body is removable and may be hoisted to surface to be dumped into truck. ½ to 2 cu. yd. capacity. 18" or 24" gage.

FREE Bulletin No. 18-b shows car details; No. 22 illustrates Automatic Coupler.

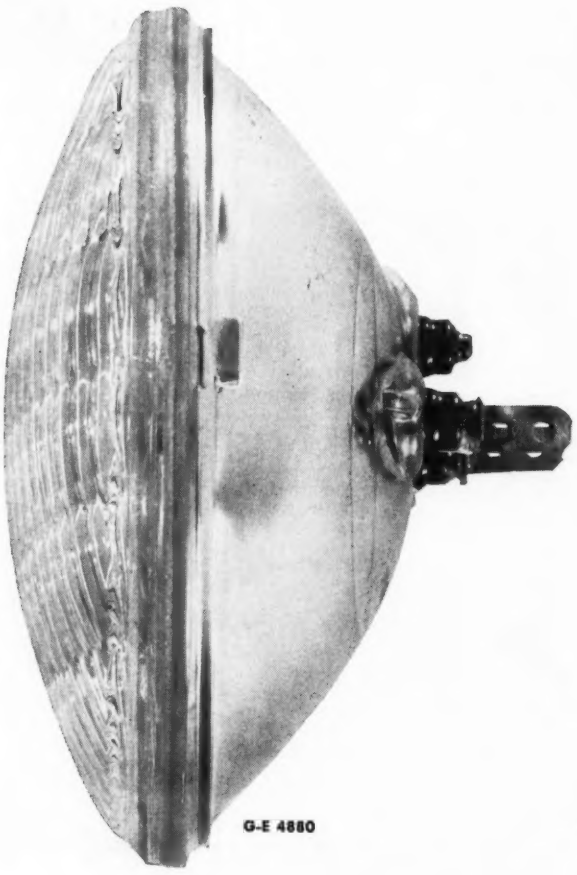
MAYO

TUNNEL AND MINE EQUIPMENT

LANCASTER, PENNA.

NOW! GENERAL ELECTRIC OFFERS A COMPLETE LINE OF *All-Glass* CONSTRUCTION LAMPS

- ✓ Far-seeing flat beam
- ✓ No inner bulb
- ✓ Reflectors never need cleaning
- ✓ Spattering won't crack lens
- ✓ Maintenance greatly reduced
- ✓ See better in all kinds of weather
- ✓ 6, 12, 24-volt size



General Electric now offers a complete line of all-glass lamps —especially designed for high-speed, off-highway earth moving equipment. They all feature high candle-power *plus* a flat, far-seeing beam. Special filament shield blocks stray upward light, reduces "bounce-back" glare, lets operators see better in any weather . . . even in dust!

Whatever the job, a G-E all-glass C.I.M. Lamp will provide the best light for it. Nothing gets past the hermetic seal of lens to reflector, so reflectors never need cleaning. No inner bulb to blacken; special hard glass won't crack in rain or snow, and they take rough treatment day after day. Choose from a wide range of sizes and styles, and specify the *right* all-glass lamp for any construction, mining and industrial equipment. Ask your G-E supplier for full information. General Electric Co., Miniature Lamp Dept. M-04, Nela Park, Cleveland 12, Ohio.

SPECIFICATIONS FOR G-E C.I.M. LAMPS

G-E No.	Circuit Volts	Watts	Bulb Diameter
HEADLAMPS			
4080	6	50	5¾"
4480	12	60	5¾"
4880	24	60	5¾"
FLOODLAMPS—PAR 46 bulbs—2 contact lugs			
4078	6	50	5¾"
4478	12	60	5¾"
4578	24	60	5¾"

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Speed your shoring with

ACROW ADJUSTABLE STEEL SHORES

ACROW adjustable steel shores... set in less than one minute by one man... removed in seconds. Hair-line adjustment... allows corrections even after pouring. Patented stud collar automatically cleans threads during stripping... your ACROW SHORES are ready immediately for next use.

All steel construction gives safer shoring... Highest load-carrying capacity. Each is a self-contained unit... no loose parts can be misplaced.

Made with standard head 6"x6" or beam type head 14"x4". Flat type head fits any size stringer. Working ranges 3'4" to 16'.

And for quickest, strongest, safest slab-decking supports at lower cost... use ACROWSPAN horizontal shoring, only two basic components. Makes ideal companion for the ACROW SHORE—the world's fastest selling shore, **OVER 4,000,000 IN USE.**

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231 WASHINGTON AVENUE, CARLSTADT, N. J.
In New Jersey: Phone WEbster 3-0450
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ACROW Denver, Inc., 1035 So. Huron St.
Denver, Colorado • Phone SP 7-5486

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Power Tamper

A power tamper equipped with an 18-in. shoe has been added to the Kelley line of tampers. The rig is handy for tamping next to walls and foundations, around culverts, piles, or piers, and in trenches. It can tamp up to 5,400 sq ft per hr.

An exhaust heater attachment is available for work on asphalt. **—Kelley Machine Div., 285 Chicago St., Buffalo 4, N. Y.**

Electric-Air Controls Operate Truck Mixer

A flip of a switch starts, stops, or reverses the mixing drum on the Challenge truck mixer. The electric-air controls, located both at the rear of the mixer and inside the cab, eliminate all levers.

Four different mixer operating ranges help adapt this unit to job conditions. It has a slow agitating range for pre-mix hauling; for long hauls it has a fast agitating and slow mixing range. For high speed job site mixing or for short hauls the drum can operate in the fast mixing range. The high speed range is handy for fast charging of the mixing drum.

The Challenge truck mixer is available in sizes ranging from 5½ to 8½ cu yd.—**Cook Bros. Equipment Co., 334 San Fernando Rd., Los Angeles 65, Calif.**

Every time you burn discarded wood forms, part of your profit goes up in smoke too. The lumber left over or wasted on many a job makes an expensive bonfire. Why not put an end to this waste? Write today for the complete story on UNI-FORM Panels—today's better, cheaper way of forming concrete.

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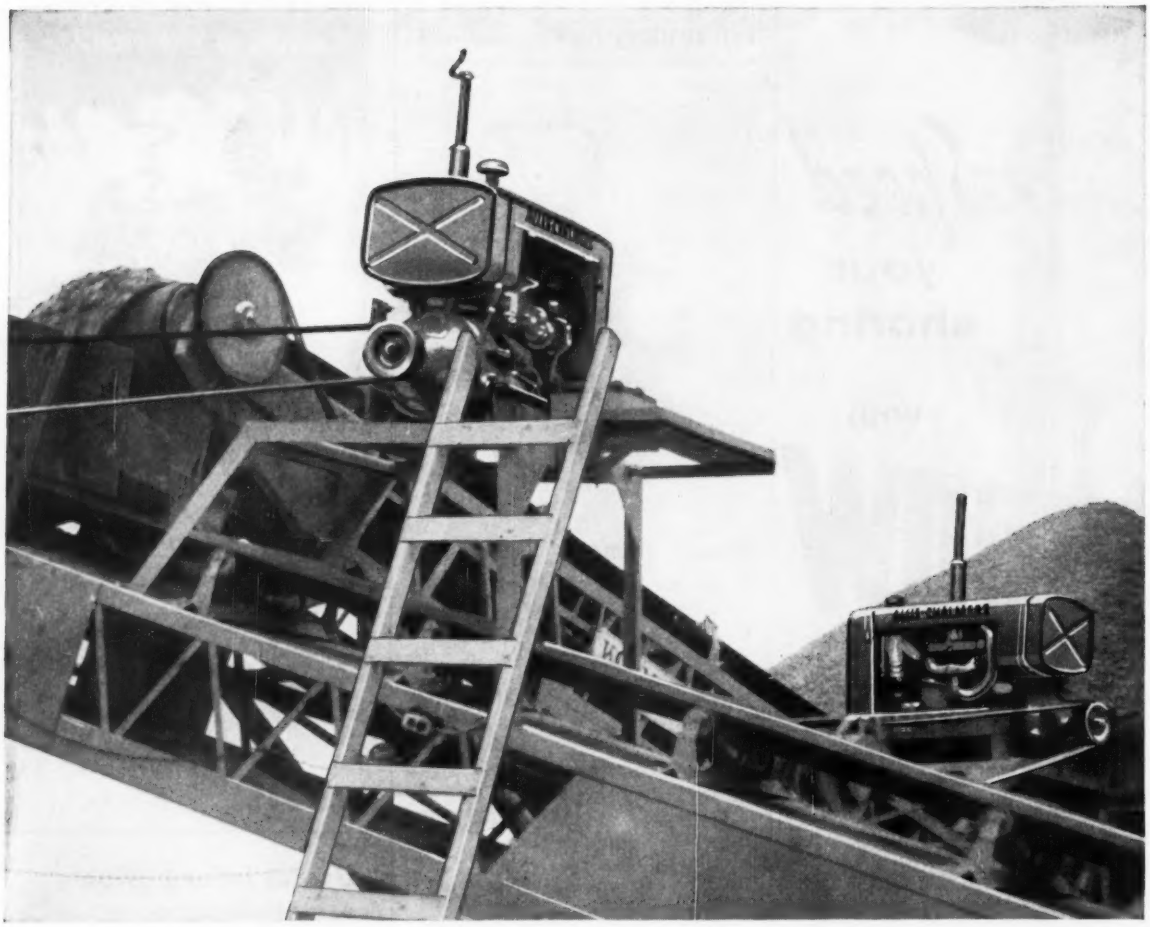
1959 COMPARATIVE SPECIFICATIONS SHEETS ON:

a. **MOTOR GRADERS**
b. **CRAWLER TRACTORS**
c. **COMPRESSORS**
d. **SELF-PROPELLED SCRAPERS**
e. **TRACTOR-DRAWN SCRAPERS**
f. **STEEL ROLLERS**
g. **PNEUMATIC-TIRED ROLLERS**

10¢ each, 10 or more, 8¢ each



These PEP units are compact, highly adaptable. Each size is available as an engine assembly, or in open or enclosed power units — equipped to fit your particular job.

put new PEP* into your jobs

Built for tough, demanding tractor service, Allis-Chalmers "Packages of Economical Power" will put real punch into your jobs. They are designed for hard work, and the thousands in daily service prove they can *deliver*.

These POWER-CRATER engines, with their short-stroke design, provide economical, big-power output. Allis-Chalmers' own trigger-quick governor keeps speed changes at a minimum, regardless of load variations.

These units are easy to maintain, too, with advantages like removable wet-type cylinder liners.

Parts and service are close by — at thousands of Allis-Chalmers dealers. Call on your dealer today to put new PEP into your powered equipment. Allis-Chalmers, Milwaukee 1, Wisconsin.

*Packages of Economical Power			
	B-125	G-149	G-226
Displacement, Cu. In.	125.2	149	226
Horsepower (gasoline)	28.3 @ 1900 rpm	45 @ 2000 rpm	67 @ 1800 rpm
Fuels: Gasoline, kerosene, distillate, and natural gas, plus LPG for the G-149 and G-226. Also diesel engines are in various models up to 516 h.p.			

POWER-CRATER is an Allis-Chalmers trademark.

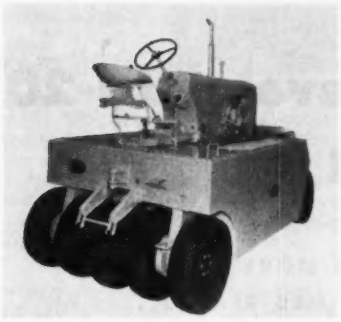
ALLIS-CHALMERS

***POWER* FOR A GROWING WORLD**

Short Tractors

Reo series D highway tractors measure only 90 in. from bumper to back of cab. Standard wheelbase is 134 in. with longer wheelbases optional. Gross vehicle weight ranges from 33,000 lb to 55,000 lb.

All three models of the series are powered by 6-cyl gasoline engines.—**Reo Div., The White Motor Co., Lansing 20, Mich.**

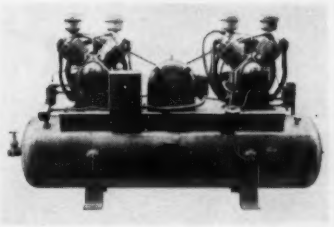


Wheel Rollers Carry More Weight

Two improved Tampo wheel rollers carry more weight than previous models. The recommended load for the 10-ton, nine-wheel SP91 is 20,000 lb; the 12-ton, 11-wheel SP-111 carries 24,000 lb.

Both machines are equipped with hydraulic brakes on all driving wheels. A second separate braking system consists of differential brakes at the transmission. This comes in handy for operation on slippery fill materials.

The power train includes a torque converter drive, automatic power shift, and a constant mesh transmission with six speeds in both forward and reverse. The sealed final drive chains operate in an oil bath. All wheels are interchangeable.—**Tampo Mfg. Inc., P. O. Box 4248, Station A, San Antonio 7, Texas.**



Two-Pump Compressor

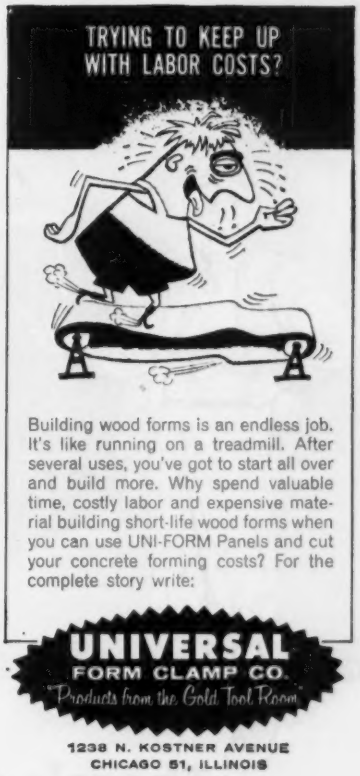
A 15-hp motor powers two compressor pumps on the OE-36-15 Champion compressor. It delivers 76 cfm at 100 psi or 63.4 cfm at 200 psi. The unit is equipped with a 120-gal tank and a magnetic starter. The compressor is 95 in. long, 28 in. wide, and 54 in. high.

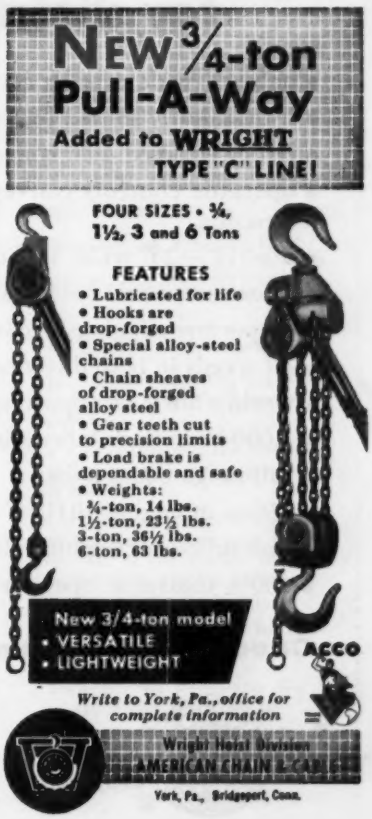
A larger model, driven by a 20-hp motor, delivers 96 cfm at 100 psi or 80 cfm at 200 psi. The dimensions and equipment are the same as on the 15-hp unit.—**Champion Pneumatic Machinery Co., Princeton, Ill.**

Self-Propelled Crane

The Unit 357 is a self-propelled, rubber-tired crane that can lift 15 tons. Also, it can work as a ⅝-yd clamshell or dragline.

One engine powers all operating functions. The operator controls the crane from the same cab when working or moving to and from a job. The entire machine is built by Unit. It rides on six wheels; it is equipped with power steering, air brakes on all wheels, and a two-speed, air-operated transmission.—**Unit Crane & Shovel Corp., Milwaukee, Wis.**





There's nothing like a Cleveland J-20 for distribution trenching

- only 60" wide over its crawlers.
- hydraulically shifted conveyor.
- pulley-enclosed dual conveyor drive.
- operator controls conveyor speed and direction.
- digs 12"—24" wide, 5½' deep.
- 4 forward wheel speeds plus reverse.
- 33 positive digging speeds.
- *all* speeds in both directions.
- world's finest trencher crawlers.
- 1,000-hour track lubrication.
- full-range boom hoist.
- 330 cu. in. engine, 50 HP @ only 1250 RPM.
- hydraulic-lift crumbing shoe, optional.
- 100% control at operator location.

DIGS MORE JOBS... IN MORE PLACES... AT LESS COST

- works in tightest quarters.
- sneaks by poles, trees, etc.
- trenches 18" from side clearance.
- digs services as well as main extensions.
- digs all soils—hard, loose, wet, dry.
- truck-loads on shallow, excess-spoil cuts.
- conveyor capacity for deep sloped trench.
- easy on lawns, sidewalks, blacktop.
- digs trench clean, to precise grade and width.
- reliable production in all job conditions.
- simplifies job-scheduling.

Check with your distributor now... get the complete J-20 story

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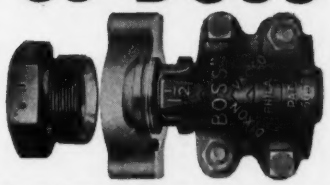
"GJ-BOSS"



GROUND-JOINT FEMALE COUPLING, STYLE X-34

SO *Reliable* FOR PILE DRIVING

...AND ANY STEAM, AIR, WATER AND HYDRAULIC SERVICES...

HIGH OR LOW PRESSURE

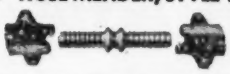
Washerless

Unequalled for safety, efficiency and long service life. Ground-joint union between stem and spud provides leak-proof, trouble-free seal . . . no lost or worn-out washers to replace. All parts malleable iron or steel, rustproofed. Furnished with superstrong "Boss" Offset and Interlocking Clamps. Sizes ¼" to 6", inclusive.

COMPANION MALE COUPLING "BOSS" STYLE MX-16

Companion coupling for "GJ-Boss", described above, and "Boss" Washer Type Couplings Style W-16. Each size fits same size hose . . . oversize hose not required. Furnished with "Boss" Offset and Interlocking Clamp. Sizes ¼" to 6", inclusive.

"BOSS" HOSE MENDER, STYLE BM-16



The practical, safe way to restore damaged hose to service. Fitting consists of corrugated mender tube and two "Boss" Interlocking Clamps. Tube has flanges to engage clamp fingers. Thoroughly rustproofed. Sizes ½" to 6"

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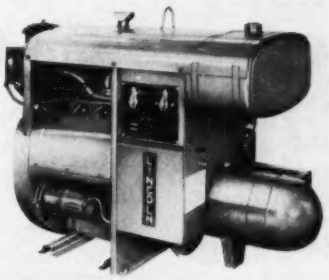
EQUIPMENT NEWS...*continued*

Small Air Compressors

Winslow piston-type air compressors weigh only 18 lb including the electric motor. The units are 10 in. long, 5¾ in. wide, and 9½ in. high. The ac electric motor is rated at ⅛ hp, 115v.

Maintenance is at a minimum because special steels, aluminum alloys, and other materials eliminate all lubrication.

Available accessories include air receiver tanks, pressure switches and regulators, gages, relief valves, moisture traps, and air purifiers. — **Winslow Mfg. Corp., 3695 E. 10th Court, Hialeah, Fla.**



Small Welder Is Easy to Start

An air-cooled engine welder features a self starter and an engine idler for speed control. The welder accelerates to operating speed as soon as the arc is struck and slows to idling speed 8 to 10 sec after the arc is broken.

The self starter consists of a starting motor, 12-v battery, actuating pushbutton, charging ammeter, and charging rate control switch. The welding generator supplies charging current through a special control circuit. And there is a magneto ignition.—**Lincoln Electric Co., Cleveland 17, O.**

MISSING ANY PANELS?

Ever wonder why you never recover all of your forms when a job is completed? They're often destroyed . . . cut up to fit . . . broken . . . damaged in handling . . . burned for firewood . . . used as ramps or otherwise mis-used and abandoned on the job site. A UNI-FORM Panel can't be sawed up or broken. For the complete story write:

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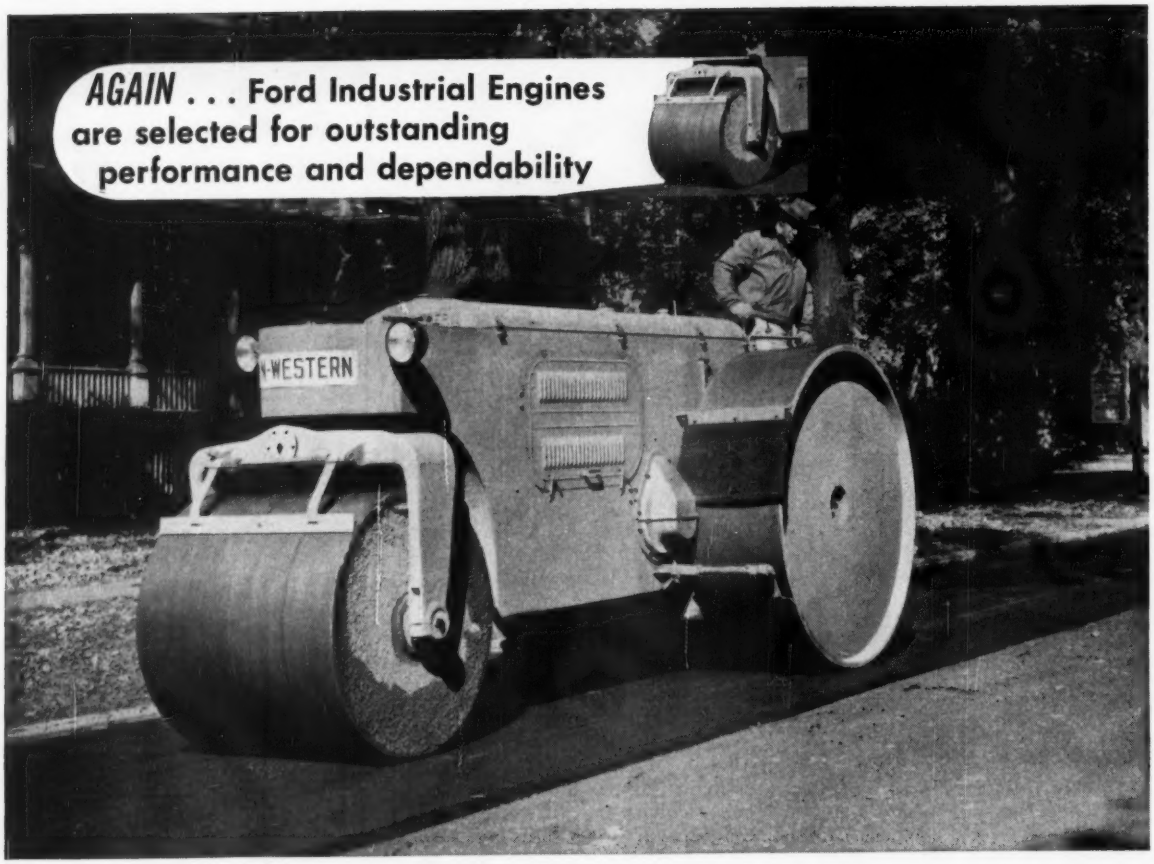


Ford-powered roller provides smooth, steady 14-ton "*squeeze*" for road binding operation!

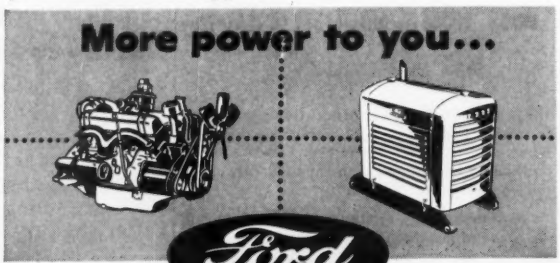
Whatever the material—crushed stone, soil cement, or blacktop—the Ford-powered Austin-Western 3-wheel roller is built to make short work of any compacting job. And just as Ford power contributes to the effectiveness of the Austin-Western roller, a Ford Industrial Engine can bring a new kind of efficiency to your construction equipment.

Ranging from 134 to 534 cubic inches, Ford engines offer a host of modern durability features such as Short Stroke design to reduce friction and wear . . . Deep-Block construction for smoother performance . . . and full length water jackets for better cooling and longer engine life. With features like these, Ford engines now give you *more horsepower per pound of engine weight than ever before possible.*

All Ford engines, including Ford's two highly economical diesels, are available as complete assemblies or power units. Because these engines can be serviced by any nearby Ford Dealer, you can keep downtime to a minimum *wherever you go.*

So to be sure you get the most for your power dollar, specify modern Ford Industrial Engines for your construction application.

FORD POWER IS RIGHT FOR YOUR EQUIPMENT, TOO!



INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION, FORD MOTOR CO., P.O. BOX 598, DEARBORN, MICH.

West of Rockies write to:
FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 6787, LOS ANGELES 22, CALIF.
FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 1666, RICHMOND, CALIF.

Diesel Pile Hammer

This diesel pile hammer weighs 11,350 lb and delivers 24,000 ft-lb per blow. The McKiernan-Terry DE-40 hammer has a 4,000-lb ram and operates at 48 to 52 blows per min.

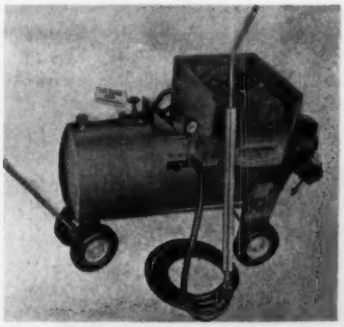
The hammer is completely self-contained. It consumes fuel at the rate of 3 gal per hr. The built-in tank holds 19 gal of diesel fuel. The unit also carries its own lubricating system. A pump lubricates all critical points.

The hammer is designed for mounting in standard pile hammer leads. A cushion-mounting isolates the working parts from shock of the impact blow.—**McKiernan-Terry Corp., Dover, N. J.**

Eight Truck Cranes

Quick-Way is offering eight models of truck cranes for the current year. Crane capacities range from 8½ tons to 25 tons. Shovel capacities for these units range from ⅜ yd to 1 yd.

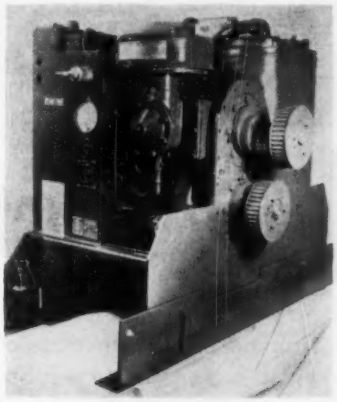
All cranes are mounted on Quick-Way carriers available with either 6x4 or 6x6 drive. Power steering and diesel engines are optional. — **Quick-Way Truck Shovel Co., P.O. Box 1800, Denver, Colo.**



Steam Cleaner Gets Rinse Attachment

A hot water rinse attachment now is standard equipment on the Electro-Magic motor steam cleaner. The coils of the steam cleaner itself also can be cleaned with this attachment.

The cleaner supplies up to 100 lb of steam pressure in 90 sec. Push-button controls operate the unit.—**Electronics, Inc., Vermillion, S. D.**



Vehicle's Engine Drives Compressor

Jeeps, trucks, or tractors can carry the Worthington 125-cfm rotary compressor. The vehicle's engine drives the unit through a power take off and belts. All controls can be operated from the vehicle's cab.

The two-stage, oil-cooled compressor is equipped with a speed control, minimum pressure valve, engine governor, oil cooler, and a combination air-oil reservoir. All parts are mounted on a welded steel frame. The unit weighs 850 lb and is 31½ in. high, 39¼ in. wide, and 28 in. long.—**Worthington Corp., Holyoke, Mass.**

FORMING GIVE YOU A HEADACHE?

Sometimes, concrete forming *can* be a headache. But, when you put your problems to our concrete forming experts you can solve them quickly and efficiently. At no cost, we will study your job, provide a detailed cost estimate, prepare preliminary form details, bill of material and give you our recommendation for construction procedure. Why not take advantage of this free service? Send us a set of plans today, we'll do the rest.

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KATOLIGHT PORTABLE POWER PLANTS give your crews "plug-in" electricity anywhere, whenever it is wanted. Here is handy, dependable electric power to operate all types of power tools or to provide steady, bright flood lighting.

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Special Units up to 750 KVA to meet specific requirements.

Yes . . . with instant, dependable electric power on the job, work speeds up . . . costs go down!

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DOUBLE-DUTY • TRIPLE-TOUGH

Quaker Thermoid water-suction hose

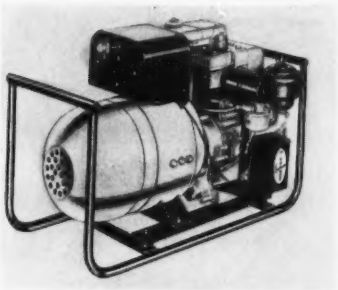
Whether you feed it light-duty or heavy-duty work, Thermoid-Quaker water-suction hose gives you long, champion-like service. It's sturdy enough to withstand full vacuum and direct connection to centrifugal and piston pumps. Yet it's light and flexible . . . well-muscled but manageable.

The toughness comes in three layers. First, a black, natural-rubber tube that resists mild acids and alkaline water . . . abrasive sand and grit. Second, a strong, durable carcass of heavy cotton cord interwoven with heavy-gauge, copper-coated spiral steel wire. Third, a black natural-rubber cover that stands up under the hardest knocks . . . combats abrasion, sunlight, and rough weather.

Ask your Thermoid distributor about Thermoid-Quaker water-suction hose (1½" to 4" ID, 50-foot maximum lengths). Or write to *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Streets, Philadelphia 24, Pennsylvania.*

THERMOID DIVISION **PORTER** **H. K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; PEERLESS ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools "Federal" Wires and Cables "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

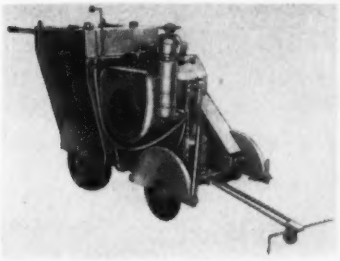


Automatic Controls Govern Idling Speed

Automatic idling controls on the Winpower portable electric plant permit the unit to idle until a load of 100 w or more is applied, then it revs up to operating speed and voltage. When the load is removed, it drops back to idling speed.

An air-cooled Briggs & Stratton engine powers the electric plant. Standard equipment includes a stop switch, pilot light, vibration dampers, rope or recoil starter and a carrying handle or a dolly.

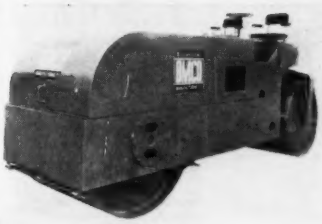
Three models with capacities of 1,500, 2,500, and 3,500 w are available. All models produce 115-v, 60-cycle current, but the larger two also are available with a 115/230-v rating. Weight of the electric plants ranges from 112 to 221 lb.—**Winpower Mfg. Co., Newton, Iowa.**



Concrete Saw Rides on Tricycle Undercarriage

The Tri-Line concrete cutter rides on a tricycle undercarriage that gives it good maneuverability. An air-cooled gasoline engine powers the unit at variable speeds up to 40 fpm. All controls are grouped on a panel for easy operation. A hydraulic depth control automatically adjusts the segmented diamond blade to a pre-set depth.

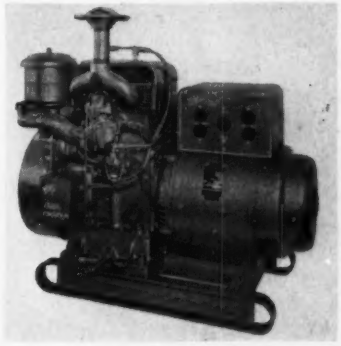
Water tanks and pumps are optional. A manually propelled model is also available. — **Engineered Equipment, Inc., Waterloo, Iowa.**



New Steel Roller

An 8-12 ton steel tandem roller, first of a line of four such units, has been introduced by Browning. The unit is equipped with a 240-gal water tank. Either a gasoline or a diesel engine powers the roller through a torque converter drive. A single lever controls the four forward and four reverse speeds. Power steering, controlled by an automotive type steering wheel, is standard.

Other units to be added to the BMCO line of steel rollers will include 3-5, 5-8, and 8-10 ton units.—**Browning Mfg. Co., 111 Humble Ave., San Antonio 6, Tex.**



Big Electric Plants

Winco engine generators produce 7,500 w for portable or standby applications. The 705 series units are equipped with an idling control that the manufacturer says saves on fuel and cuts down engine wear.

Special trailers to carry these electric plants are also available. The Mobil-Power trailers ride on two rubber-tired wheels and are equipped with an adjustable leg that rides on a small caster.—**Wincharger Corp., Sioux City 2, Iowa.**

take 10 minutes

to look through this catalog

You'll find the answers to many concrete forming problems plus an eye-opening look at the fastest, most modern way to form concrete. Write for the catalog today. There's no obligation.

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Parm Pritchard was just promoted. New production boss. "I just got the breaks," he says.

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Parm had his eye on management. Management had its eye on him. And when a man's interests, and a company's interests come this close together, something good is bound to happen. And did!

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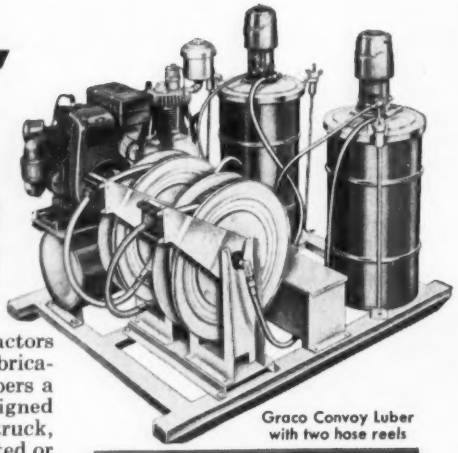
Men who read more...earn more!

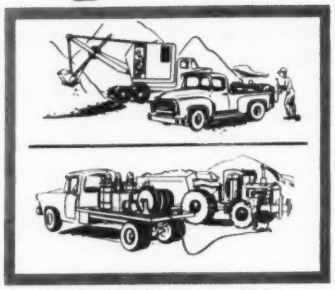
Save Time, Cut Costs with this PORTABLE LUBE UNIT



Graco Convoy Luber with two hose reels

Small and large contractors who want "on-the-spot" lubrication find Graco Convoy Lubers a profitable investment. Designed for truck, trailer or pick-up truck, these lubers are easily mounted or removed . . . go to work immediately to provide fast greasing, oiling and air service in the field. You pump lubricants direct from the original shipping drums.

Free 28-page catalog illustrates Graco portable lube equipment. Includes tips and ideas for those who want to plan their luber to fit special operating conditions. Write for your copy.



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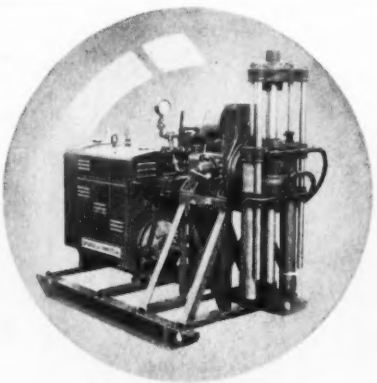
GRAY COMPANY, INC.
346 Graco Square • Minneapolis 13, Minnesota
(See phone book yellow pages "Lubricating Devices" for Graco Suppliers)

S&H MODEL 30

CORE DRILL MACHINE



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- The ideal machine for foundation investigation and shallow mineral exploration.
- Available with either screwfeed or hydraulic swivelheads with or without built-in water pump and a wide choice of power units.
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- The Model 30 is a quality machine produced by a quality manufacturer.

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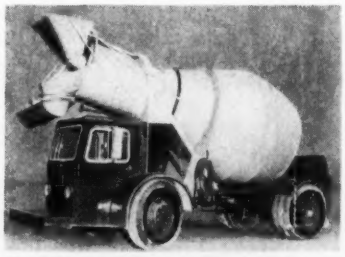
Two Power Trowels

Gasoline engines power two Remington power trowels. A 3-hp Briggs & Stratton engine drives the 34-in. model, and a 2¼-hp unit powers the 28-in. trowel.

Blade pitch controls and engine controls with safety throttle releases are mounted on the handles. Blades can be changed easily by loosening large knobs; knobs also control the height of the handle.

Reversible floating blades and reversible finishing blades are optional. The larger model T-434 carries a $420 price tag, the smaller T-428 is priced at $295.—**Remington Arms Co., Inc., Bridgeport, Conn.**

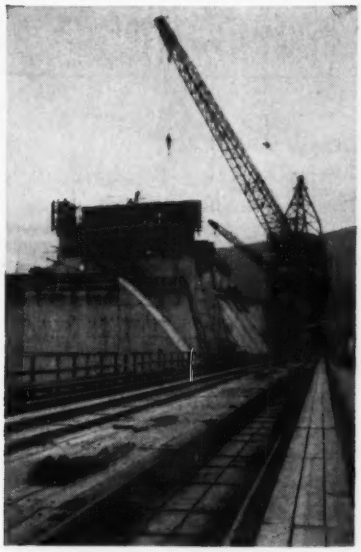


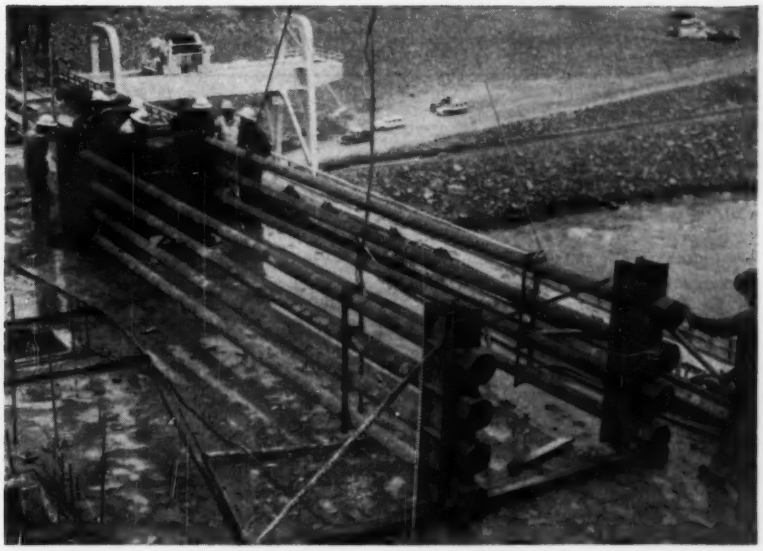
Truck Mixer Discharges in Front

Spotting the Willard truck mixer on the job site is easy because backing up is not necessary. The mixing drum discharges to the front giving the driver good visibility while moving the truck into position and discharging the concrete. All controls are in the cab. One engine powers both the truck and the mixing drum.

The two-axle truck is equipped with a 5-cu-yd mixing drum, but bigger units mounted on three-axle trucks with all-wheel drive will be available soon.—**Willard Concrete Machinery Co., 11700 Wright Rd., Lynwood, Calif.**

(Advertisement)





GIGANTIC UPSET ANCHOR BOLTS, some of the world's largest, secure 8 tainter gate assemblies in this mile-long, 400,000 kw capability, hydroelectric power project. Imbedded and anchored in concrete, these tension bolts absorb tremendous gate thrust load from upstream water pressure, as their projecting threaded ends secure the gate-supporting bearings.

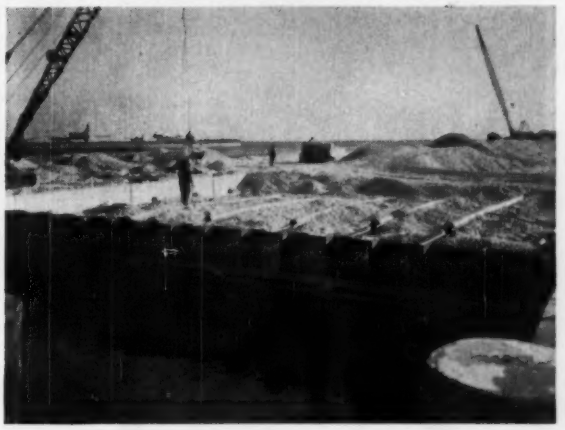
Noxon Rapids Dam, Sanders County, Montana
The Washington Water Power Co., Morrison-Knudsen, Contractor

FURNISHED COMPLETE BY COMMERCIAL these ton-weight bolts are 33½ feet long, 5½ inches in diameter. Ends are upset to 6¼ in. diameter for a length of 9 inches. Both headed ends are threaded—one end receives the deadman anchor sleeve to be buried in concrete—the other end takes a hex nut to secure the gate bearing. At no sacrifice of strength, upset heading saves 750 lbs. of steel—28%—on each bolt.

How to anchor big jobs!

100 FT. LONG TIE ROD ASSEMBLIES, complete with turnbuckles, washers and nuts, tie into the continuous wales every 7 feet and anchor the land fill retaining wall. The threaded ends of these 600 lb., 2¼ in. rods are upset by COMMERCIAL to a headed diameter of 2⅞" for maximum strength without excess weight.

Lakefront Land Fill, Chicago Exposition Hall
Lake States Engineering Corp., Contractor



CHANNEL WALES COMPLETE with spacers, washers and nuts, reinforce latest Chicago lakefront land fill. COMMERCIAL double-channel wales span the entire facade of the future exposition hall site. Separated by 3¾" pipe spacers, two 12" channel wales furnished in 10 ft. sections are spliced into a continuous reinforcement for the vertical steel pilings. Loads and stresses due to extensive fill on one side and wave action on the other are stabilized.

You'll find COMMERCIAL the top "one-source" for wales, tie rods, large anchor bolts, special fasteners, handrail and curbing for heavy construction. Write to Commercial Shearing & Stamping Company, Dept. B-10, Youngstown 1, Ohio.

COMMERCIAL
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Studebaker Offers Light Trucks, Pickups

The Studebaker line of trucks includes models with gross vehicle weghts ranging from 9,000 lb to 23,000 lb. Four-speed transmissions are standard, but five-speed direct and overdrive units are available on trucks equipped with V-8 engines.

Two 1-ton models are mounted on a 131-in. wheelbase. A 6-cyl, 118-hp engine powers one; a 180-hp V-8 drives the other.

Six trucks are available in the 1½-ton range. Three are equipped with 118-hp, 6-cyl engines, the other three have 180-hp V-8's. Wheelbases range from 131 to 171 in.

Two 1-ton models feature four-wheel drive. One of these has a 6-cyl engine; the other has a V-8. Both are mounted on a 131-in. wheelbase.

Four 2-ton models are the heaviest of the line. Wheelbases range from 131 to 195 in. The power plant is a 210-hp V-8 engine.

Pick up trucks are available in ½ and ¾-ton models with gross vehicle weights ranging from 5,000 to 7,000 lb. A choice of two wheelbases—112 and 122 in.—and four engines are offered.

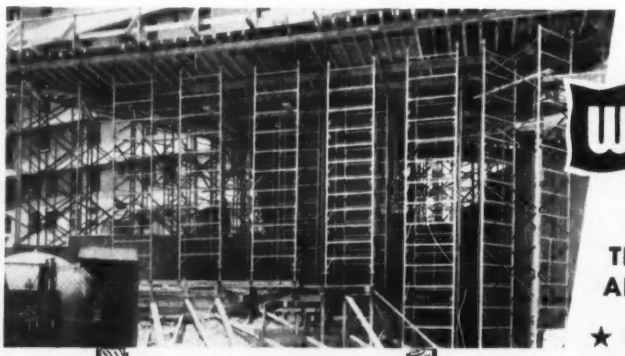
Engines for the pickups range from 6-cyl, 90-hp units to the optional 210-hp V-8. Three-speed transmissions are standard, but four-speed units or overdrive are available. Automatic transmissions are optional on models with V-8 engines.—**Studebaker-Packard Corp. South Bend, Ind.**

Small Trencher Handles Own Backfilling

A small crawler-mounted trencher handles both digging and backfilling. Maximum digging depth is 66 in.; maximum width is 12 in. A special backfill blade mounted on the boom can be raised and lowered hydraulically. The blade can be mounted at the center and angled to the left, or it can be offset to extend beyond the tracks.

An air-cooled Wisconsin engine, rated at 12.5 hp, powers the Davis T-66 trencher. It can work at speeds ranging from 1 to 12 fpm. Maximum travel speed is 2 mph. An instant forward and reverse control and independent drive clutches and steering brakes for each track give the trencher good maneuverability both when digging and backfilling.

A specially designed trailer is available for transporting the trencher.—**Davis Mfg. Inc., 1500 S. McLean Blvd., Wichita 13, Kan.**



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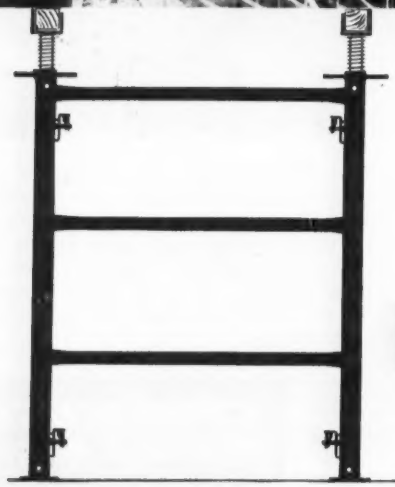
HI-LOAD
HEAVY DUTY
SHORING

THE ANSWER TO
ALL YOUR SHORING PROBLEMS

★ Shores safely to any required height.
★ Carries 10,000 lbs. per leg, 20,000 lbs. per panel.
★ Completely versatile.
★ Has load bearing top ledger.
★ Easy erection and storage.
★ Experienced factory engineering service.



Check the Yellow Pages for your nearest Waco Distributor or . . .

WRITE TODAY
for the complete Waco Hi-Load Story.

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Licensees: Armson Iron Works, Windsor, Ontario
Tubular Structures Corp. of America, Los Angeles, California

Laying heavy-duty Texaco Asphaltic Concrete pavement on 13 miles of U. S. Route 19, used by traffic to and from Florida's Sunshine Skyway Bridge.

Florida converts inadequate road into a dual Asphalt highway

When Florida built the new Sunshine Skyway Bridge over Tampa Bay, U. S. Route 19 in Pinellas County could not cope with traffic to and from the bridge. The State remedied this by converting the old 24-foot road into a modern, divided Asphalt highway.

A new 24-foot lane was constructed for northbound traffic. Its heavy-duty surface of hot-mix Texaco Asphaltic Concrete was laid on an 8½-inch lime-rock foundation, over a 12-inch stabilized subgrade. Hot-mix Texaco Asphaltic Concrete also was used to resurface the existing road, which now serves southbound traffic.

This economical method of using heavy-duty Texaco Asphalt paving to convert existing, inadequate roads into up-to-date, divided highways offers substantial savings in the construction of many sections of the Interstate Highway System.

Whether you are building a highway in Florida, a farm-to-market road in Wisconsin, an airport in Texas or a municipal expressway in Rhode Island, Texaco Asphalt products are conveniently available at strategically located refineries and terminals. For assistance with an Asphalt paving or maintenance problem, get in touch with our nearest office listed below. Our 55 years of Asphalt experience is at your service.

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Please send me your two brochures containing helpful information on heavy-duty, intermediate and low-cost types of Asphalt construction for highways, streets, airports, etc.

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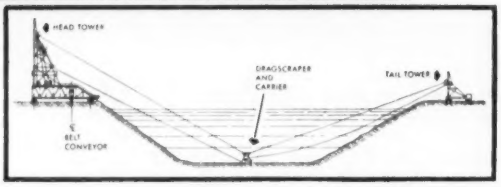
Tough Digging, Long Hauls... Routine Jobs for Sauerman DragScrapers

240-Ft. Bank... 350-Ft. Haul

This mobile Sauerman Tower Excavator digs 480 yds. per hr. on an average haul of 350 ft. from a high bank to a portable field hopper. The 12-yd. Crescent DragScraper operates between steel head and tail towers. The towers are mounted on two sets of railroad tracks and ride on four sets of trucks. DragScraper power is supplied by two hoists mounted on the head tower. One hoist operates the load and pullback cables, the other is used to tension the track cable. The hoists are controlled by one operator located in the cab on the tower. The load cable handles over 400,000 tons of material before replacement.



Drawing shows typical mobile tower excavator digging in wet pit.

75 Ft. Under Water... 800-Ft. Span

A 5-yd. rapid-shifting DragScraper supplies about 200 yds. per hr. to the plant hopper in background. Bridle tower in foreground is one of two supporting the bridle shifting cable which is controlled by the third drum of the Sauerman hoist. Lateral shifting of the DragScraper's line of operation is readily accomplished by power-shifting the trolley and tail block to a new position on the bridle cable. The DragScraper is digging 75 ft. under water and the operating span is 800 ft. from head frame to the bridle towers. Over a million tons have been excavated from this pit. The DragScraper often operates 24 hrs. a day to handle contract demands.

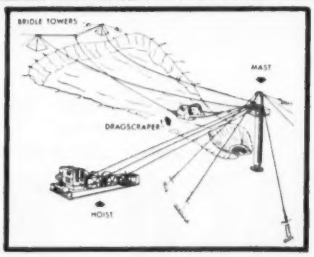


Diagram shows details of Sauerman rapid-shifting DragScraper.

Sauerman machines dig and haul in one continuous operation... work on high bank, dry pit or under water... handle most bulk materials. Consult Sauerman engineers about your job. We will promptly supply appropriate literature.

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Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

New Publications

These catalogs and bulletin from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

HOISTS—The Peerless line of hoist products for overhead handling of loads from ¼ ton to 60 tons are described in a new catalog. The publication covers more than 20 different kinds of cranes, hoists, and specialty and accessory items. Photographs and line drawings supplement the text in illustrating the design and construction features of the hoists.—**The Harrington Co., Plymouth Meeting, Pa.**

STEEL FORMS—Ceco-Meyer describes its steel forms for forming concrete joist slabs. The manual (4001-N) contains complete tabular data of the firm's steel forms of the steeldome, flange, adjustable, and long form types. Included are concrete quality tables for all four types and descriptions and specifications of duct floors for electrification systems.—**Ceco Steel Products Corp., 5601 West 26th St., Chicago 50, Ill.**

MULTI-ARC WELDING—A bulletin issued by J. B. Nottingham reviews recent developments in multi-arc welding, a method of supplying as many as 30 operators with a single power unit. The publication explains how the multi-arc principle reduces equipment requirements and simplifies installation and maintenance. A table summarizing comparative costs shows how multi-arc systems can produce savings in power equipment.—**J. B. Nottingham & Co., Inc., 441 Lexington Ave., New York 17, N.Y.**

SWINGING SCAFFOLDS — An 8-p bulletin issued by Patent Scaffolding describes the applications of small, swinging scaffolds for light duty operations. Bulletin J-11 illustrates safety features and details of the lowering and raising mechanism.—**The Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N.Y.**

DRAINAGE PIPES—Armco has published a catalog that covers its various types of corrugated pipe and pipe arch for drainage struc-

TORQUE TALK ABOUT CLARK® EQUIPMENT

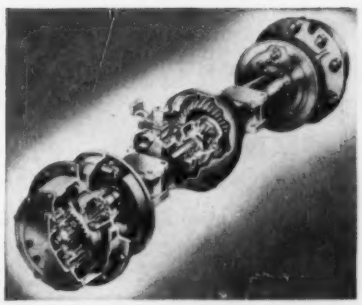
CLARK PLANETARIES END AXLE TROUBLES FOR ARIZONA CRANE OWNER

Like many contractors, this Flagstaff (Arizona) crane owner used to consider broken axle shafts part of the game. All too often, one would crack or snap, and a lot of time and money would go down the drain.

Then the company bought a crane equipped with Clark planetary axles, front and tandem-rear. Their work pace continued, even grew. Ten to 20 hours a day, six days a week. Thousands of poles and pipe sections to unload and place. Bridge sections to set. Concrete to pour. 35 to 40 mph job-to-job travel required.

That's been the picture for two years now. There hasn't been an axle failure—or even a hint of trouble! Clark planetaries, by taking 70% of the torque load off the shaft, have reduced strains that effectively!

Why not specify these money-savers in *your* next truck-crane. Drop us a postcard; we'll be glad to tell you what crane makes and models include Clark planetaries as either standard or optional equipment.



CLARK PLANETARY AXLES

4 sizes: 28,000 to 120,000 lbs ground loading capacity. Available in single or tandem couplings.

Shovel owners boost efficiency with Clark Torque Converters

For smooth power, easier handling, elimination of shock-loading, reduced wear on power train, most makes of excavators can now be equipped with Clark torque converters.

This Marion ¾ yd shovel, for instance, has a Clark Model 10-13AKFG torque converter behind its GMC diesel engine.

Owner M. A. Biggerstaff reports less down-time with the machine than with any other shovel he's ever had . . . despite the tough job of shot-rock loading it's been doing for the past two years.

FOR FURTHER INFORMATION . . .

and full details on any of Clark's automotive components, simply address a card or a call to:

CLARK EQUIPMENT COMPANY
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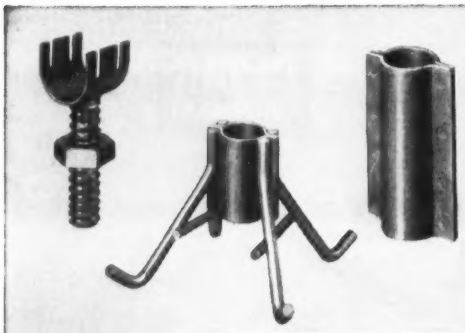
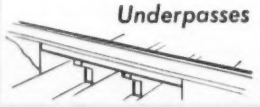


HEAVY-DUTY SCREED SUPPORTS

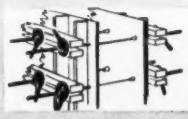


Overpasses and Underpasses

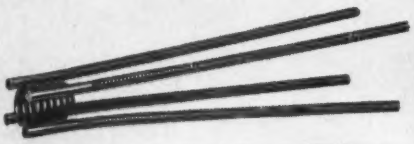
THREADED COIL TIES

Engineering Structures

TILT LOCK CLAMPS



Heavy-Duty Forming



4-STRUT COIL ROD ANCHORS

Temporary or Permanent Anchorage

SUPERIOR

One Source For All Accessories For Dependable Concrete Forming

These are examples of the numerous types of form ties, anchors, inserts, and other items in Superior's most complete line of concrete accessories. The illustrations show the variety of concrete form work and related jobs in which Superior accessories are used. All items are designed to provide the most dependable and efficient forming methods.

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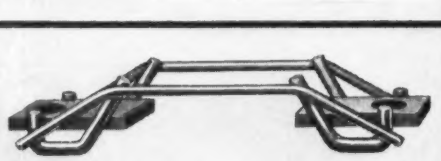
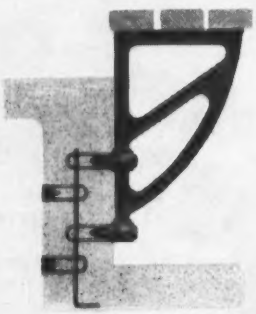


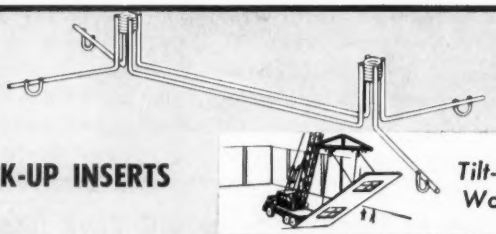
PLATE HANGER FRAMES

Bridge Superstructures



RISER-FRAMES

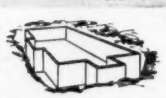
Stadiums and Grandstands



PICK-UP INSERTS

Tilt-Up Work

SNAP TIES



Ordinary Foundations

NEW PUBLICATIONS . . .
continued

tures. The publication provides dimensions and properties of factory fabricated, riveted, or locked seam products and recommends general installation procedures. Write for catalog CMS-5859.—**Armco Drainage & Metal Products, Inc., Middletown, O.**

BATCH PLANT—An 8-p manual explains how a small contractor can build a complete batch plant layout, piece by piece, around a portable batching unit. Termed a "building block concept" by the manufacturer, the manual shows how batch plant production can increase as component parts are added without discarding previously acquired equipment. The brochure contains engineering drawings, specifications, and job photographs. —**The Boardman Co., Oklahoma City 1, Okla.**

SCRAPER—Features of the 28-yd Model B Tournapull 360-hp scraper are illustrated in a new brochure. The publication (TP-433) discusses the combinations of engines and transmissions available for the scraper. It also shows how to interchange a 35-ton rear dump hauler with the scraper behind the prime mover. Copies are available through LeTourneau-Westinghouse distributors. — **LeTourneau-Westinghouse Co., 2301 N.E. Adams St., Peoria, Ill.**

MOUNTABLE SPREADER—Details and applications of Fox materials spreaders that can be mounted on a dump truck are given in an 8-p booklet. Information on the control system, engine, agitator, and auger construction are included. The booklet also contains specifications. — **Fox River Tractor Co., Box 469, Appleton, Wis.**

COMPRESSOR—Features of the Le Roi 125 cfm portable rotary compressor are presented in a 4-p brochure. Operating details and condensed specifications of the sliding vane, two-stage compressor model 125RG2, included. —**Le Roi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.**

JOINT SEALER—Physical properties and applications of Hornflex Thiokol LP-32 sealant for watertight joints are covered in

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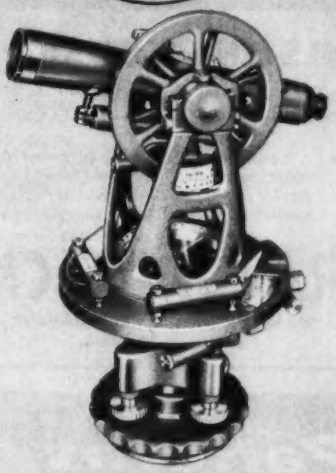

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NEW PUBLICATIONS . . .
continued

a 16-p catalog. Included are mixing instructions and quantity estimations for the sealant. — **A.C. Horn Companies, 2133 85th St., North Bergen, N.J.**

FRONT-END LOADERS—Three separate Allis-Chalmers booklets describe front-end loaders. Booklet 1092 covers the 7,000-lb capacity rubber-tired TL-16 Tractoloader. The 9,000-lb TL-20 Tractoloader is detailed in booklet 1093. Features of the HD-11G crawler-mounted tractor shovel with 2¼ cu yd bucket are included in booklet MS-1133. — **Allis-Chalmers Mfg Co., Milwaukee, Wis.**

HIGHWAY FORMS—Details of Heltzel Cam-Lok forms for highway construction are presented in a brochure. Illustrations of the cam-locking principle for joining highway forms and a table of standard ¼-in. form sizes and weights are included. — **Heltzel Steel Form and Iron Co., Warren, O.**

SUBGRADER—Operating details and specifications of a subgrader that excavates by vibration are covered in an 8-p Blaw-Knox bulletin, No. 2652. An optional deep-cut attachment designed for airfield work is explained in another 2-p bulletin, No. SD-124. —**Blaw-Knox Co., 300 Sixth Ave., Pittsburgh, Pa.**

DUMP TRUCK — A 16-p catalog covers the new International Model 95 Payhauler, a 27-ton, rear dump truck. It describes the corrugated body design, 375-hp engine and power train, main frame and support members, Torqmatic brake, cab, and power steering system. The catalog is available from International equipment distributors. — **International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

SHEET PILING—Advantages of renting steel sheet piling are discussed in a 24-p catalog available from L.B. Foster. Catalog 400 details standard, rolled, and fabricated sections, and gives typical applications. It also illustrates pile arrangements for rectangular and circular cofferdams. —**L.B. Foster Co., P.O. Box 1647, Pittsburgh 30, Pa.**

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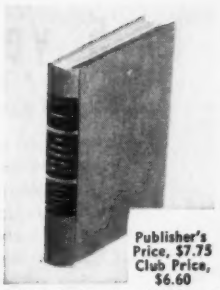

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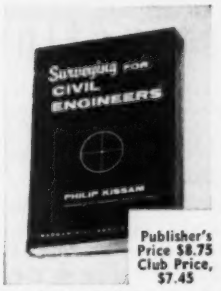

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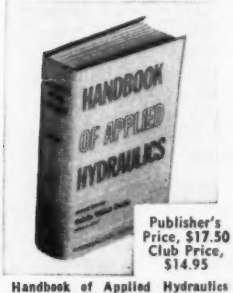

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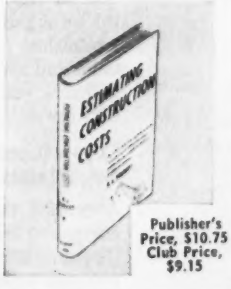

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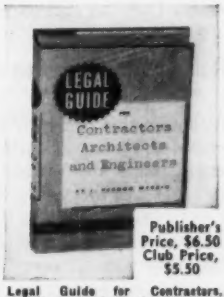
Construction Planning, Equipment, and Methods by R. L. Peurifoy. How to plan and carry out a project.



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CM-3

A pipeline-sewage job in the city of Greensboro. Required 500 feet of reinforced concrete pipe. Part of $1 million Thompson-Arthur project.

$250,000 Highway paving project, U.S. 220 south of Greensboro. Surfacing 20 miles with 3 inch of hot plant-mix asphalt concrete.

Over 400 units of machinery...and 600 men of construction in 5 years for Thompson-

In 1951, The Thompson-Arthur Paving Company of Greensboro, North Carolina, completed $1.4 million of construction. In the 5-year period through 1959, this contractor completed $30 million.

The contracting business as a whole is nomadic by nature. While many contractors conduct operations in widely scattered locations . . . this contractor concentrates its operations primarily in North Carolina. According to the president, Mr. John Thompson, this firm's reputation for service plus quality work is responsible for an increasing volume of work in and around Greensboro and within the boundaries of North Carolina and parts of Virginia.

From $1.4 to $10 million a year capacity

Although this company actually started business under the name of Thompson-Arthur Paving Company in 1951, the organization has operated as a construction unit since July, 1941. It was the Western Division of F. D. Cline Construction Co. until 1951. In that year the present partners, John Thompson and Ernest Arthur, acquired the construction company with an invested capital of $250,000.

In 1951, Thompson-Arthur Paving Company completed $1.4 million of work including asphalt surfacing, stone base work, sewage, pipeline, airport and bridge construction. In 1959, the company increased its volume in excess of $5 million. According to Mr. Thompson the company can handle a $10 million capacity of work. The bulk of this contractor's work is for federal, state, and municipal governments as well as some private construction.

What it takes to produce $30 million of construction in 5 years

Thompson-Arthur Paving Company is a contracting organization which takes great pride in the large number of loyal, experienced personnel who have many years with the firm. Among the key personnel who play leading roles in the organization's management and direction are John Thompson, Jr., vice president and manager of Virginia operations; B. G. Team, vice president; George F. Robinson, Supt. of Asphalt Construction in North Carolina; Hugh Gresham, chemist and technical advisor of asphalt work; Robert Thompson, supt, Grey Hylton, superintendent; Stuart Hockaday, ass't supt, W. B. Tyer, ass't sec'y and treasurer.

In addition to these men there are 267 permanent men on the staff and up to 300 workers during the peak season.

5 asphalt plants produce 350,000 tons a year

In order to meet its demands for tremendous quantities of asphalt in its paving operations, Thompson-Arthur has five asphalt plants in operation. The bulk of its yearly 350,000-ton production is used by the company, but some is sold to others. In the course of a year, Thompson-Arthur Paving Company *uses better than 1 million tons of all kinds of paving materials.*

Operates own asphalt emulsion plant

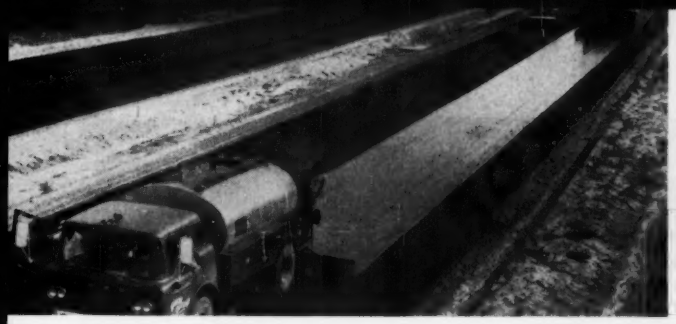
One of the significant operations of this progressive contractor is the processing of asphalt emulsion. This plant was established in 1958 and is under the direction of management and Mr. Gresham. This plant processes several million gallons a year . . . and adds one more factor to this contractor's operating efficiency and work capacity.

Large equipment inventory speeds operations and increases contractor's capacity

According to Mr. Thompson, president, the nature of his company's operations demands an inventory of equipment that runs into millions of dollars. From the time the present partners took over . . . they have added more equipment with an eye to speeding up operations and improving production and service.

THOMPSON-ARTHUR PAVING COMPANY EQUIPMENT

- 40 dump trucks — (International, Ford, Dodge)
- 35 flat bed and service trucks
- 31 pickup trucks — (Chevrolet)
- 23 truck trailers
- 11 tractor trucks
- 5 asphalt plants (2 portable) — (Cedarapids, Barber-Greene)
- 10 compressors — (Chicago-Pneumatic, Worthington, Jaeger)
- 6 asphalt distributors — (Etnyre, Littleford)
- 7 asphalt finishing machines
- 8 front end loaders — (Allis-Chalmers, International Harvester, Hough, Michigan)
- 14 motor graders — (Caterpillar)
- 5 generators — (General Electric, Westinghouse)
- 9 electric welders — (Lincoln, Hobart)
- 2 pile driving hammers — (Link Belt)
- 25 pumps — (Jaeger, Rex)
- 10 rollers, rubber tired — (Bros, Ferguson)
- 10 self-propelled rollers — (Buffalo-Springfield)
- 12 cranes — (Northwest, Bucyrus-Erie, Koehring)
- 2 stone spreaders — (Flaherty)
- 5 stone spreaders — (Jersey)
- 7 crawler tractors — (International Harvester, Caterpillar, Allis-Chalmers)
- 10 wheel-type tractors — (Case, International)
- 1 concrete paver — (Blaw-Knox)
- 35 two-way radios
- 9 base stations
- 2 relay stations — (General Electric)



Sub-contract for Nello Teer shows distributor in action. Project required stone spreader, a fleet of 15-ton tandem trucks, and rollers to handle material and rolling.

carve out $30 million Arthur Paving Co.

Spends $1½ million in year for equipment

Equipment often makes the difference in gaining a competitive edge in the contracting business. Success of the Thompson-Arthur Paving Company is due in part to its emphasis on owning and operating the most up-to-date, efficient equipment. In 1958, for example, this contracting firm invested $500,000 for new equipment . . . and an additional $380,000 in 1959.

Key men influence equipment purchases

Many of this firm's key men have been associated with Mr. Thompson and Mr. Arthur for 25 years or more. These are experienced men on all levels with vast construction experience and equipment know-how. These men play an important part in the purchase of equipment. Here's what president John W. Thompson says:

> **"In purchasing the many types of major equipment, it is our policy to seek out the opinion of our key men such as operators, superintendents, master mechanics, etc. Their experience and loyalty make it practical and valuable for us to give weight to their recommendations and advice on different brands and types of equipment. In this way, we are sure of making a sound and profitable buying decision."**

$250,000 a year for equipment maintenance

With the increase in a contractor's equipment inventory comes an added investment in equipment maintenance costs. Thompson-Arthur Paving Company recognizes the tremendous value of a strict maintenance program and has built three maintenance shops in Greensboro, with 10 full-time mechanics. In the off-season, this contractor conducts a two-week session for foremen and others in the field so that each man knows his job thoroughly. A part of this training includes maintenance and repair work for operators . . . and each man does the repairs on his equipment during the winter months. This planned instruction has proved extremely successful for Thompson-Arthur . . . and is reflected in the efficiency of their equipment and in their company growth.

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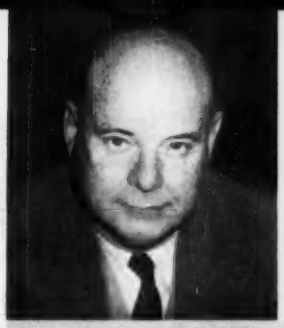

JOHN W. THOMPSON **ERNEST S. ARTHUR**

John W. Thompson, President, Thompson-Arthur Paving Company

A reader of CONSTRUCTION METHODS magazine since 1950 says:
"We look to CONSTRUCTION METHODS for its fine coverage of new construction techniques and ideas employed by other contractors. Our key personnel read the magazine carefully for helpful information on equipment and techniques. The photo-descriptive way of presenting the information makes it easy to read and understand."

Ernest S. Arthur, Secretary-Treasurer

A reader of CONSTRUCTION Magazine since 1950 says:
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Key men at Thompson-Arthur Paving read CONSTRUCTION METHODS Magazine

The key men in important contracting firms like Thompson-Arthur Paving Company look to CONSTRUCTION METHODS magazine for information on construction techniques, equipment, and materials. Eleven of Thompson-Arthur's key personnel subscribe to CONSTRUCTION METHODS, including both Mr. Thompson and Mr. Arthur.

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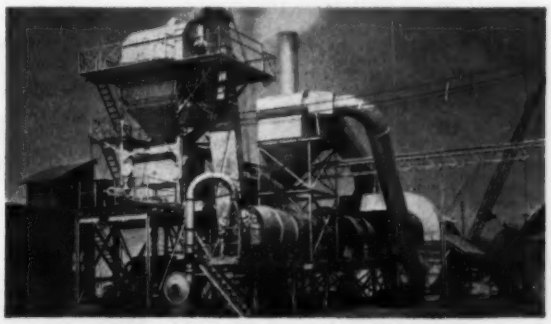

One of Thompson-Arthur's 5 asphalt plants. This one plant produced over 100,000 tons last year.

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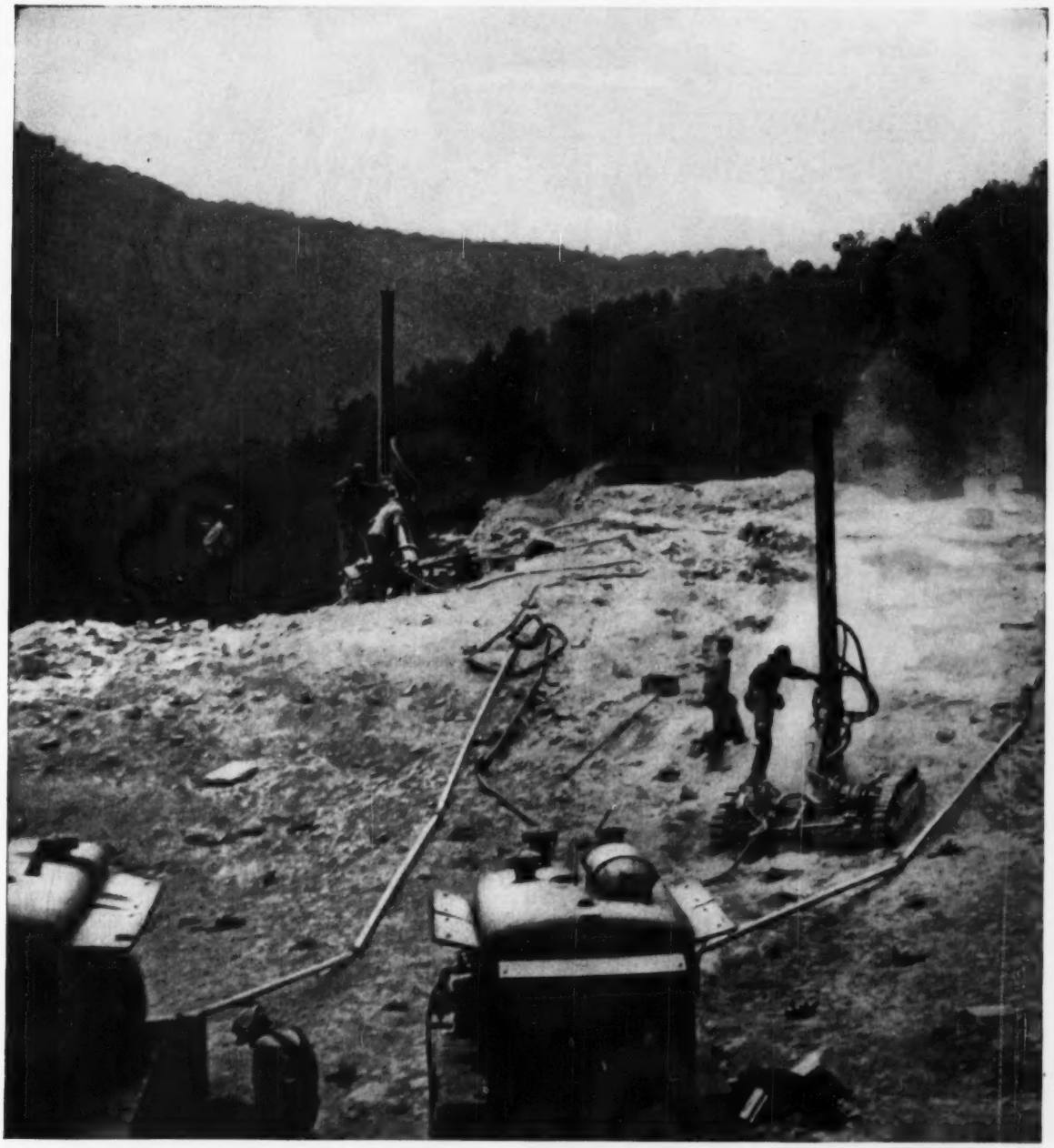

Drill Steel Bores Sandstone in Foothills of Great Smokies

This crawler-mounted drilling equipment, using Bethlehem Hollow Drill Steel, is boring blast holes for the Pigeon River Project, a new 4-lane highway which eventually will connect Asheville, N. C., and Knoxville, Tenn. This 3.6-mile section, handled by Asheville Contracting Co., called for the removal of some 650,000 cu yd of medium-hard, abrasive sandstone. Even with the blast holes from 20 ft to 40 ft deep, the drilling went smoothly; costs were kept low. Bethlehem Hollow, in Carbon and Ultra-Alloy grades, was furnished and reconditioned by Brunner and Lay Southern, Inc. This drill steel is at its best in jobs like this, where the drilling is tough, day after day.

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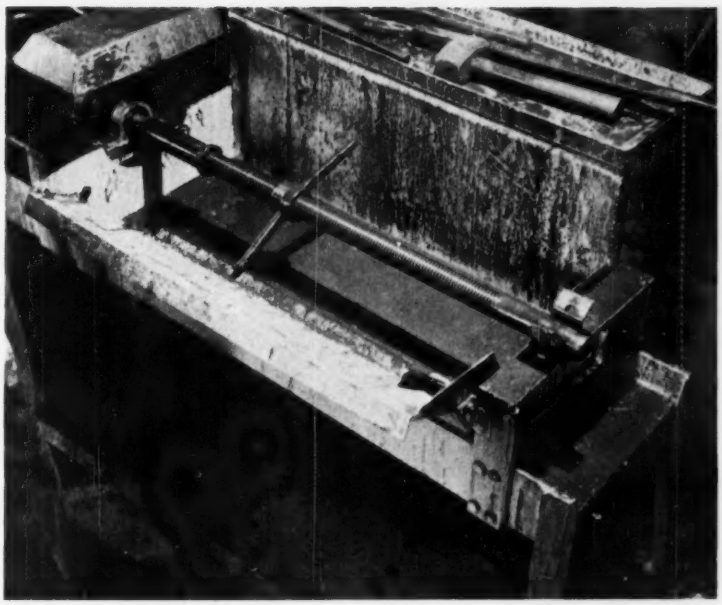
EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Machine Cleans Scaffold Legs



REMOVING DIRT—An adjustable scaffold leg is mounted on the machine and rotated while the collar moves back and forth removing dirt and concrete from the threads.

A SPECIAL MACHINE cleans adjustable scaffold legs in the shop of the Gilbane Building Co. at Providence, R.I.

Henry Wheeler, manager of Gilbane's equipment division, designed and built the machine in the shop from sheet metal and pieces of structural steel. A small electric motor drives it.

First the adjustable legs are soaked in diesel fuel. Then they are mounted on the machine, one at a time, for cleaning.

The legs fit on a shaft and rotate while an adjustable collar travels back and forth along the leg, removing dirt and bits of dried concrete. The man attending the machine manually removes any big or particularly hard chunks of dirt or concrete. The collar is made to travel back and forth until all dirt is removed and the collar can move freely from one end of the leg to the other.

The Machine

The cleaning machine consists of a pan that holds cleaning solution and is supported on four legs. The pan is equipped with brackets and supports that hold the motor, switch, pulley, and the scaffold leg being cleaned. In addition, there is a tray for tools. The machine is 4 ft 3½ in. long.

A 12-in. WF beam is the basic component of the pan. The web of the beam forms the bottom, and sheet metal makes up the sides and ends of the pan as well as the raised tray for the tools. All legs and braces for the machine and stiffeners for the sheet metal are made of 1x1x⅛-in. angles.

At the top of one end of the pan is a U-shaped spring clip that holds the tail stock end of the adjustable leg in place. At the other end are supports for the motor and pulley.

Drive Mechanism

A ¾-hp electric motor drives the machine. The motor works at 1,750 rpm, but a belt and pulleys reduce the speed to 400 rpm at the scaffold leg. A reversing switch controls the motor.

The motor shaft is equipped with a 2½-in. sheave. It drives a belt that runs to a 10-in. sheave and rotates the leg that is being cleaned. The large sheave is mounted between two self-aligning pillow blocks. The distance between the blocks is the same as the thickness of the pulley hub. Two set screws in each pillow block hold the shaft to the blocks.

On the pan end of the pulley shaft is a cut-off half of a scaffolding sprocket that is permanently attached to the shaft. The adjustable leg fits over the sprocket, and a hinge pin through the leg and the sprocket holds the leg in place and makes the torque connection.

Cleaning

To make the collar move along the leg, it is kept from rotating with the leg. An angle, attached to the side of the pan, catches one arm of the adjustable collar and keeps it from rotating but permits the arm to slide along the angle.

When a scaffold leg is mounted on the machine, the adjustable collar can be at either end because the leg can rotate in either direction. The angle that catches the collar arm is of such length that the arm will drop off the angle at either end of the threaded portion of the scaffold leg.

Several passes of the collar are necessary to clean a leg. Whenever a large chunk of dirt stops the collar, the shaft stops rotating because the drive belt is adjusted to slide in case of sticking. When repeated attempts to dislodge hard pieces of concrete won't do the trick, they have to be removed manually.

The machine's attendant uses a brush to keep the leg well soaked in cleaning solution while it is on the machine.

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Methods Memo . . .

Engine Runs on Anything

A retired industrialist has developed a relatively inexpensive device that makes it possible for a gasoline engine to burn diesel oil, kerosene, alcohol, or just about any fuel that will ignite.

The man is Ralph M. Heintz, formerly an officer of the Cleveland manufacturing firm, Jack and Heintz, Inc. His invention is a pre-combustion chamber that weighs about 3 lb and fits into a spark plug well. He calls it "RAM Straticharge."

A six-cylinder engine would require six of these pre-combustion chambers. And the engine would have to be modified by enlarging and tapering the spark plug well and by drilling an auxiliary fuel injection port behind the cylinder's air intake valve. Heintz says the installation would cost only about $200 for a six-cylinder truck engine, including labor.

The Straticharge makes possible substantial fuel savings, Heintz says, not just because the engine can use cheaper fuels but also because combustion is more nearly complete. A rich fuel-air mixture is spark ignited in the pre-combustion chamber; the explosion discharges it into the cylinder where it hits nearly pure air; with so much air present, combustion is far more complete than in a gasoline engine.

Heintz says a gasoline engine should work about 20% longer to a gallon of fuel with his Straticharge. That is in addition to the savings on the cost of the fuel.

The Straticharge is not yet on the market, but Heintz says it should be available soon. At the moment it is being tested in a number of vehicles.

Colored Roads

Highways color-coded to facilitate traffic flow may soon be built. Several methods of using colored road surfaces at interchanges or intersections are under study.

Results of tests conducted by the Minnesota Highway Department were presented to the Highway Research Council recently. The seven-week test showed that drivers reacted favorably to color coding and found it generally helpful.

A reflective coating that shows up well at night as well as in the daytime was used at interchanges in this test. Turnoffs and exit ramps were marked with blue; on-ramps and points of merging traffic were colored yellow; and through lanes were white. The coating, produced by the Minnesota Mining and Manufacturing Co., can be applied to any pavement.

A separate study in the same field is reported by the Esso Research and Engineering Co. This method involves mixing pigmented plastic materials with aggregate to form a surface layer of pavement about 1 in. thick. The plastic material is colorless and can be combined with pigments of any color.

Bridge Canyon Dam

Los Angeles wants to build a $164-million dam and power plant on the Colorado River 117 miles upstream from Hoover Dam.

The city's Department of Water and Power has filed an application with the Federal Power Commission to build a 466-ft-high dam at Bridge Canyon with generating facilities to produce 3,000,000,000 kilowatt hours annually.

Cement Haulers Make the First of 24,000 Deliveries

Just delivering cement for the huge Glen Canyon Dam in Arizona is a major operation. It must be hauled 188 miles by truck from Phoenix Cement Co.'s plant at Clarkside, Ariz. By mid-summer the job will require 6,000 barrels a day.

The first truck loads arrived at the site last month. During the next three years, about 24,000 truck loads—a total of 3,100,000 barrels of cement—will be delivered at Glen Canyon. The trucks will travel a total of 8,640,000 miles.

All this work will be handled by a fleet of 20 Autocar lightweight tractors with 220-hp Cummins diesel engines. Each tractor pulls two hopper-type Fruehauf trailers with a payload of about 27 tons.

To keep their weight down, the tractors have aluminum frames, cabs, hoods, and radiator shells and Fiberglas fenders. Belyea Truck Co. of Los Angeles owns and operates the fleet.

Merritt-Chapman & Scott Corp. is building the dam under a $108-million contract that includes placing about 5,000,000 cu yd of concrete. First concrete on the job is for lining the 50-ft diameter spillway tunnels.

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LOCATION: HOWARD A. HANSON DAM, ON GREEN RIVER, EAGLE GORGE, WASHINGTON

Operating conditions: basalt and sandstone

Here's another project where Timken® carbide insert bits proved their exceptional long life and fatigue resistance. In construction work at the Howard A. Hanson damsite, Henry J. Kaiser Co. and Raymond International, Inc. used 143 drills. The drilling rate was 24″ to 36″ per minute. Hole depths drilled ran up to 40′. With Timken carbide insert bits, they drilled 300′ to 500′ per regrind, got 10 to 12 regrinds per bit—made important savings in drilling costs.

Which Timken Bit should you use?

In hard, abrasive ground, use the Timken carbide insert bit for greatest economy. In softer ground, use the low-cost Timken all steel multi-use bit. Both bits are interchangeable in the same thread series; you can switch bits as the ground changes. Dozens of different Timken bits fit the same drill steel. And both types are made from Timken electric furnace fine alloy steel, have special shoulder unions to protect threads against drilling impact. Let us help you select the Timken bit best suited for your job. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*

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